

STORYTELLING IN THE METAVERSE: ARTIFICIAL INTELLIGENCE AND THE TRANSFORMATION OF IMMERSIVE CINEMATIC EXPERIENCES

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ABSTRACT

The emergence of the metaverse combined with convergence of immersive media technology is reshaping the ontology of cinema. This paper studies the ways in which AI-based systems are reconfiguring cinematic storytelling. By offering a conceptual and case-based analysis of the intersection of AI-enabled practices in metaverse and resulting cinematic experiences, it explores how AI technology has changed the ontology of cinema. The study proposes a new theoretical framework of “AI-Mediated

Immersive Cinema” by integrating insights from film theory, new media studies and algorithmic culture for understanding this change. The paper provides new insight into how cinema fits within the wider network of platform-based and data-driven environments, helping to enrich current conversations in media studies and communications about how technology is transforming our relationships with storytelling and our experiences as audiences of multimedia and immersive content.

KEYWORDS: Metaverse Artificial Intelligence Immersive Cinema Virtual Reality
Interactive Storytelling Media Convergence

INTRODUCTION

Cinema has historically evolved in parallel with the advancement of technology. It has changed from analog and theatrical mode to exhibiting in digital, networked and platform-based ecosystems. This change is part of a bigger trend in media

convergence, where the lines between different types of media, technologies and audiences are getting blurred (Jenkins, 2006). The emergence of immersive media technologies, including virtual reality (VR) and augmented reality (AR) has enabled filmmakers to craft experiences that transcend the viewing screen and immerse audiences in a three-

dimensional interactive digital realm. In this context, the rise of the metaverse represents a significant shift for cinema from a representational medium to an experiential and navigable narrative space (Lee et al., 2021).

Artificial Intelligence plays an increasingly larger role as a generative force for changes in media. AI-based systems create opportunities for personalization, adaptive narrative trajectories and creation of new aesthetic forms and user experiences based on insights derived from data (Napoli, 2019). In addition, procedural storytelling techniques allows narrative content to be generated in real time, thus contradicting the linearity and permanence associated with traditional cinematically produced narrative content (Manovic, 2001). Furthermore, the way an avatar can be utilized in an environment enables users to become immersed in a story by creating a virtual identity in a narrative world, thereby erasing the boundary between audience and participant and changing the ontology of how we experience cinema (Murray, 2017). Despite of these advancements, the existing frameworks within film & media studies have yet to develop enough theoretical insight into how artificial intelligence affects them. Classical spectatorship theories have traditionally defined viewer as a passive subject who is positioned outside the diegetic space (Metz, 1981). On the other hand, AI-mediated immersive environments facilitate the spectators to become co-

creator, decision-maker in narrative development and an active participant in creating meaning.

Accordingly, this paper investigates three principal research questions: In what ways does AI alter the cinematic experience within the metaverse? What changes occur regarding concepts of authorship and narrative control in AI-governed environments? Does greater immersion deepen meaning-making or does it endanger critical distance and interpretive engagement? The paper argues that AI-mediated metaverse cinema is a completely new way of experiencing all the elements of cinematic practice whether it is narrative, authorship or spectatorship. The paper redefines cinema as an evolving interactive medium embedded within the infrastructures of AI and immersive media environments.

LITERATURE REVIEW AND THEORETICAL FRAME WORK

Researchers have studied the evolution of cinema in the era of digital technology by examining how media are converging, what new technologies are emerging and how audience behaviour is evolving. Early scholars exploring the transition from analogue cinema to digital cinema predominantly concentrated on the shift from photochemical film processes to computerized motion picture processes and on the increasing significance of the use of computer software and programming in creating the style and aesthetics of films (Rodowick, 2007).

The transition from analogue to digital has fundamentally altered not only the physical production but also the distribution of motion pictures. The emergence of new ways of producing, displaying and watching films have eventually allowed filmmakers to produce more immersive and participatory narratives that extend beyond traditional film screens. With growing utilization of virtual reality (VR) and other forms of immersive media in cinema, this area of study has taken on new significance (Ryan, 2015).

Further, the use of AI is rapidly becoming more common in scriptwriting, film editing, recommendation systems and audience analytics, leading to the emergence of an algorithmic culture (Striphas, 2015; Rahman & Ali, 2024). In recent times, the concept of the metaverse as an analogy for integrating immersive technologies, networks and digital economies is gaining popularity. Though, it is still an emerging area of research, metaverse discussions consider virtual worlds to be shared spaces in which individuals can engage with others through avatars to participate socially, culturally and economically (Dionisio et al., 2013).

While VR research concerns itself with elements of embodiment and immersion, AI research examines the themes of automation and algorithmic mediation and research within the metaverse looks at virtual ecosystems. A comprehensive examination that integrates these three components is presently missing, providing no framework for understanding

contemporary cinema. This paper seeks to bridge the gap by situating contemporary cinema within AI-mediated metaverses. By merging concepts from digital cinema studies, immersive media studies, and algorithmic culture, the paper proposes a cohesive theoretical framework for understanding AI-driven immersive cinematic environments.

In this paper, a cohesive theoretical framework is developed to analyse how AI and metaverse technologies have changed film-making and experiencing cinema. It proposes AI-Mediated Immersive Cinema framework by synthesizing key insights from media and film theory, digital and AI studies and immersion theory.

FROM MEDIUM TO DATABASE LOGIC AND THE RECONFIGURATION OF SPECTATORSHIP AND APPARATUS

The foundational premise of this framework is the concept based on McLuhan's (1964) assertion that media functions as extensions of how people see and think. As such, the metaverse has changed the way we perceive immersive environments. It has reconstituted cinema into an environment rather than a separate text. This change is explained in more detail by Manovic's (2001) idea of database logic. Database logic refers to the fact that in comparison with traditional storytelling methods which supports fixed narratives, new media structures have been created based on modular and non-linear collections of data. As such, AI enhanced cinematic solutions create non-linear narrative experiences that resemble databases that

can be dynamically used to create new narrative templates in real time and used as an interactive user experience in a way that contrasts with how traditional linear storytelling is created. Classical film theory has characterized viewing film as an activity that is passive, where viewers engage with narratives created by filmmakers through interpretive acts (Mulvey, 1975). Further, apparatus theory contextualises viewers within a structured representation system, demonstrating how cinematic techniques and viewing conditions influence perception and ideological position (Baudry & Williams, 1974). However, when it comes to immersive and AI mediated contexts the frameworks of traditional film theory and apparatus theory run into significant limitations as the viewer moves from outside to directly inside the diegetic world of the visual text, directly interacting with avatars and other interactive interfaces.

DIGITAL AND AI THEORY-ALGORITHMIC CULTURE, PLATFORMIZATION AND IMMERSIVE IDENTITY

The evolution of cinema in the metaverse is closely linked with the rise of algorithmic culture where computational processes impact cultural production, distribution and consumption (Striphas, 2015). The AI systems not only influence the choice and recommendation of content, but also enables participation in content creation. It enables procedural storytelling and real time adaptation. This dynamic is further embedded within the framework of Platformization, where

digital platforms govern users' interaction, visibility and harvest data from consumer engagement (Van Dijck et al., 2018). Platforms serve as both structural and cognitive framework in metaverse-based cinema facilitating the creation, experience and monetization of narratives.

Immersion theory is vital to understanding the ways that an audience experiences the different types of AI mediated film, particularly through the concepts of presence, embodiment and virtual identity. Presence refers to the psychological experience of being in a mediated environment and it is enhanced through the use of immersive technologies, such as virtual reality and real-time rendering systems (M. Slater, 2009). Embodiment expands on this idea by showing how body and its representation in a virtual world can affect how one perceives and interacts with that world. Users develop digital identities through the use of avatars, which allows them to participate in narrative worlds actively. In a sense, this form of interaction changes the dynamic between the person, or subject, and the medium by creating a hybrid condition where one act as both observer and agent in a cinematic space.

TOWARD AN AI-MEDIATED IMMERSION FRAMEWORK

The research integrates different theories in order to develop a new conceptual framework of AI-mediated immersive cinema. The framework defines cinema as an adaptive system where narrative,

authorship and spectatorship are generated through the interaction of human users and algorithmic processes within platformized environments.

Figure 1: Conceptual Framework of Cinematic Experience in Platform-Based Digital Ecosystems

The diagram below depicts a conceptual framework to illustrate how film experiences have changed from traditional linear, passive to more interactive and immersive in the form of adaptive, interactive and physical experiences in the Digital Ecosystem of Platforms. This framework demonstrates that the transition from a linear to an adaptive, interactive and physical

experience occurs through both user participation and the use of algorithms as systems for evaluating user-generated content via immersive and algorithm-based platforms which have been discussed recently in relation to changes in regards to Platformization and Data-Driven Media(Dwivedi et al 2022).The framework demonstrates how contemporary media systems are gradually shaped by database structures and algorithmic logics, where content is dynamically generated, personalized, and continuously reshaped through user interaction. This marks a shift from fixed textuality to fluid, process-oriented media forms.

Figure 1: Platform-Driven Transformation of Cinematic Experience: AI, Immersion, and Participatory Media Ecosystems

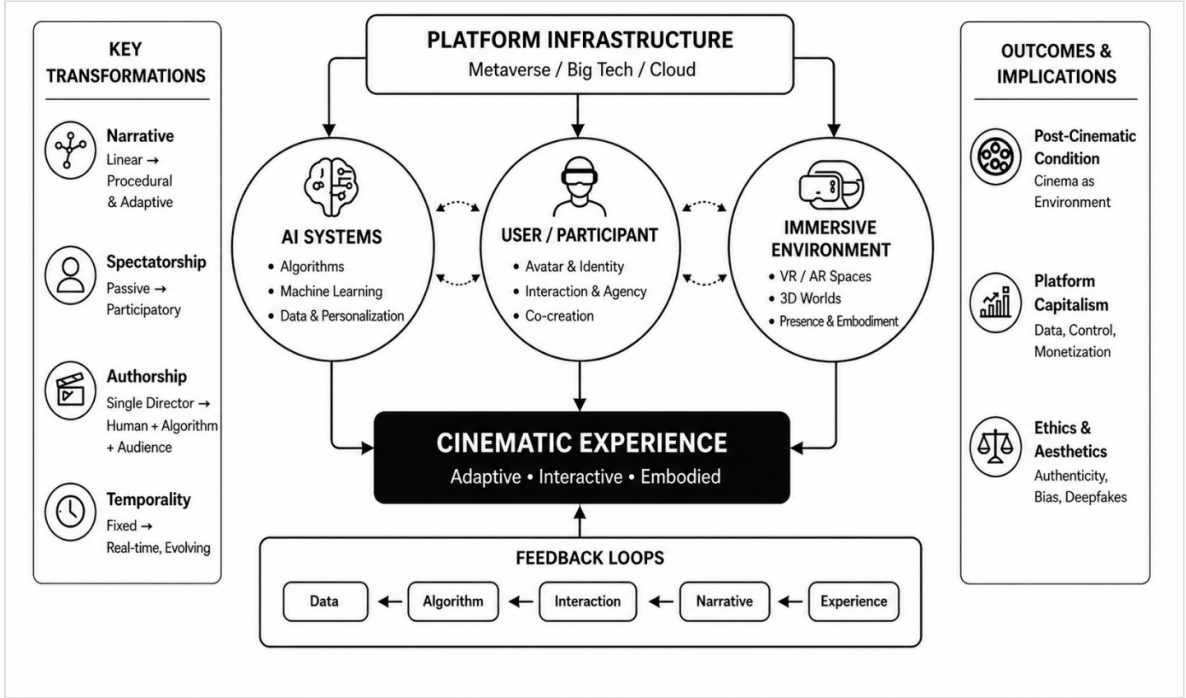


Figure 1.

Source: Author's conceptualization, adapted from Dwivedi et al. (2022)

Figure 1 depicts that the model places the infrastructure of a platform i.e. metaverse ecosystems and large-scale digital

platforms at the top. It also demonstrates how these platforms contribute to setting the conditions necessary to produce, distribute and engage with films. That is

to say, they are the technological and economic environment in which all other elements operate.

There are three core elements underneath this structure identified as interdependent nodes:

1. **AI Systems:** This section regulates procedural narrative, real-time content and personalization through the use of machine learning models, algorithms and data driven processes. The computational logic behind this determines how the story will be told dynamically and how it will appear aesthetically.

2. **User/Participant:** The node signifies audiences as an active participant in the cinematic universe. Participants have the authority to create meaning for themselves via avatars or interactive interfaces while also controlling how they experience the story through the interaction with the characters within it.

3. **Immersive Environment:** This component looks at the principles of virtual and augmented reality environments, and how they enrich cinema through experience, embodiment and spatial interaction within narratives.

Each of these three sections are interconnected to one another. This establishes a continuous or ongoing feedback loop between user-based feedback, algorithmically-based systems and immersive environments. Their interaction leads to the cinematic experience, which is defined here as an emergent phenomenon with adaptive narratives, participatory engagement, and embodied presence. The model sees

cinema not as a linear or text-based medium, but as a system that people can interact with.

METHODOLOGY

This research employs a qualitative design based on a case study methodology, particularly effective for analysing emerging and intricate media phenomena like AI-mediated immersive cinema (Creswell & Poth, 2016). Case study methodology was utilized to compare the different forms of immersive and AI-based cinematic experience. Multiple case studies allow for the identification of trends, variances and new characteristics of cinema in the metaverse through the analysis of a wide variety of cases which share commonalities and are interrelated (Yin, 2018).

Three types of cases are selected for the study purposively to represent the convergence of cinema, immersive environment and AI:

1. **VR Films:** *Carne y Arena* (2017) directed by Alejandro González Iñárritu, is an example of immersive storytelling where embodied experience through the use of spatial presence allows individuals to virtually engage with a narrative environment in the first person.

2. **AI-generated Stories:** *Sunspring* (2016) directed by Oscar Sharp demonstrate how AI can create, structure and tell stories, creating new challenges to the conventional understandings of authorship and creativity in cinema.

3. **The Metaverse Platforms:** There are platforms such as *VRChat* or *Horizon Worlds* that contribute to the immersive,

participatory and socially embedded nature of the virtual world by enabling users to interact with each other using their avatars while engaging with cinematic material through those avatars.

METHODS OF ANALYSIS

In order to capture the multi-dimensional characteristics of AI-mediated immersive storytelling, this study utilized a variety of qualitative analytical techniques. In order to examine the narrative structures, themes and the representational strategies within the selected cases, textual analysis was employed. Next, Interface analysis assessed the design components, navigation systems and the overall user interface within an immersive environment and its effect on immersive experience. Finally, narrative analysis evaluated how narratives were organized and structured or transmitted in relation to the experience of using an AI-enhanced immersive environment.

ANALYTICAL FRAMEWORK AND PROCEDURE

The proposed integrated theoretical framework which draws upon media theory, film theory, digital platform studies and immersion theory has been employed for the analysis in this study. Each case is evaluated across three key dimensions:

- **Narrative Structure** (linear vs. non-linear, fixed vs. adaptive)
- **Spectatorship and Agency** (passive viewing vs. active participation)
- **Technological Mediation** (role of AI, interface design, and platform

architecture)

Data is interpreted through a process of thematic coding and cross-case comparison, enabling the identification of recurring patterns and critical divergences across different forms of immersive cinema.

QUALITATIVE ANALYSIS

AI AND THE TRANSFORMATION OF NARRATIVE

With the help of AI technology, cinema has developed into telling stories in ways that were previously unimaginable. In the past, stories were typically told in a linear way but AI has changed it dramatically. As storytelling becomes increasingly influenced by AI, it is now possible for users to create and manipulate stories using various forms of media in real-time. Storytelling possibilities have greatly expanded with the advent of AI-driven procedural storytelling, giving rise to multiple versions of the same story. Unlike earlier cinema, directors do not have complete control over the pace at which the story progresses. In metaverse, AI systems enable the story to progress, often unexpectedly based on user actions and interactions, which allows multiple opportunities and variations to be created for a story to progress. Ultimately, real-time content generation puts the final nail in the coffin for traditional narrative traditions, by allowing narratives to be continuously modified and shaped based on user behaviour and interaction with other users. This evolution of storytelling is in direct contrast to traditional concepts

of coherence and control over narratives and marks a significant shift from traditional linear storytelling to dynamic and data-driven narrative forms (Manovich, 2001).

FROM SPECTATORSHIP TO PARTICIPATION

The traditional spectator model of being mere observer has changed due to the advent of AI-mediated immersive experiences that allow the viewer to become an active participant. Viewers are able to interact with stories and characters through avatars created for them within metaverse platforms and VR-based cinematic experiences. The ability to participate rather than merely observe changes the relationship between the audience and the text. By interacting with the story and making choices, users become co-creators. The lines between audience, screen and narrative fade away into a single experiential space. This makes the cinematic experiences performative and interactive. This makes the cinematic experiences performative and interactive (Ryan, 2015).

AUTHORSHIP IN AI CINEMA

The Growing prominence of AI in storytelling leads to questions about the ownership and who has creative control of the work. Traditionally, directors are thought to be the main creative force behind films, particularly establishing narrative, visual and interpretative elements. However, as AI has begun to play a larger role in decision-making throughout the filmmaking process, the

traditional concept of authorship in cinema is starting to evolve away from auteur theory. This results in collaborative or shared authorship. So, the final product of a film isn't just the vision of one person, instead it's the vision and effort of many people working together contributing to the creation of that film. So, the traditional auteur theory becomes more complex leading to the hybrid model of authorship (Jenkins, 2006).

EMBODIMENT AND PRESENCE

With the introduction to the concepts of embodiment and presence, Virtual Reality (VR) has significantly changed the way people engage in the act of watching a film. Through the use of avatars i.e. the digital representation of a person's body or image, the process of becoming embodied in both a virtual and real-world environment can be fully felt by the audience. With these virtual representations, audiences can now interact with narrative environments and other people in the film, making the experience more immersive than just watching. As a result, the experience of watching a motion picture has been changed from being a representation of an experience for the audience, to creating an experiential space and an extension of oneself into the experiential space (Slater, 2009).

POLITICAL ECONOMY OF METAVERSE CINEMA

The political economy of digital platforms has played a significant role in the rise of metaverse cinema. Big tech companies

have invested in the related technologies expecting greater return. Considering the cost, these companies afford to invest controlling the infrastructure and ultimately creating new forms of platform dependency and monopoly power (Srnicsek, 2017). These platforms not only host the contents, they also control the algorithms in terms of how content is created, shared and profited from. At one hand, through data-driven storytelling, these tech firms collect and analyses the user's data to provide content tailored specifically to users thereby improving user experiences and boost engagement. On the other hand, it also rises some concerns related to privacy, surveillance and algorithmic bias.

ETHICS AND AESTHETICS

AI and immersive media's integration pose multiple challenges to creators from both an ethical and aesthetic perspective, with issues such as deepfake content and AI-generated actors making it even harder to tell what is real or fake. This brings up issues of misinformation, consent and identity. Furthermore, hyper-realistic moving images create very different standards for truth and representation within traditional film-cinema paradigms. Additionally, AI facilitates algorithmically constructed aesthetic, wherein creative decisions are partially automated and directed by computational logic.

TABLE 1. COMPARATIVE DIMENSIONS OF TRADITIONAL AND AI-DRIVEN CINEMA

Table 1.

Dimension	Traditional Cinema	AI-Driven / Metaverse Cinema
Narrative Structure	Linear, fixed	Non-linear, adaptive, procedural
Spectatorship	Passive viewer	Active participant / co-creator
Authorship	Director Centric (auteur-driven)	Distributed (human + algorithm + user)
Medium	Screen-based	Immersive environment (VR/Metaverse)
Temporality	Pre-defined duration	Real-time, evolving
Aesthetic Control	Human creative decisions	Algorithmically influenced
Engagement	Observational	Experiential and embodied
Distribution	Theatre / OTT	Platform ecosystems
Economy	Box office / subscription	Data-driven, platform capitalism
Meaning-making	Text-centred	Interaction-centred

Source: Author's compilation based on Manovich (2001), Jenkins (2006), Baudry (1975) and Dwivedi et al. (2022)

FINDINGS

The analysis shows how different changes are interconnected and how they change the ontology, structure and experience of cinema in AI-mediated metaverse environments. Cinema is changing from a linear way to a more dynamic, interactive system that is shaped by algorithms, user participation and platform infrastructures.

CINEMA AS AN INTERACTIVE SYSTEM

The results show that AI in the metaverse changes films from being fixed texts to being flexible and interactive systems. In contrast to traditional cinema narratives which are pre written, AI-driven environments allow story to change in real time. As users and algorithms work together, the storylines change all the time, making the structure of the story dynamic. This change makes movies more like simulated environment resulting into movie experience more about the process than the story, with more focus on staying engaged than on ending the story.

REDISTRIBUTION OF NARRATIVE AUTHORITY

The study shows that narrative authority has changed a lot. It has gone from being based on the filmmaker's point of view to a system that includes algorithms and audiences. Directors are traditionally considered to be the primary authorial agents in traditional film making. But in the metaverse, there are several other participants who contribute creatively to the project when using AI-assisted systems, including algorithms that create, modify and arrange components of a narrative and end-users who actively contribute to shaping the narrative by their input and interaction. Collectively, all of these participants represent a hybrid form of authorship in which both humans and machines collaborate in the process of creating meaning. The role of a filmmaker is no longer defined as being the sole creator but rather as the person who establishes the rules and mechanisms for storytelling to occur interactively in real-time.

IMMERSION AND THE EROSION OF CRITICAL DISTANCE

Another finding is that films in the metaverse has a greater degree of immersion and embodied involvement than traditional cinema. For example, audience are likely to experience this type of engagement while using VR interfaces and communicating with avatars. Thus, feeling more emotionally and physically present. This quality increases the interest of users and therefore makes film feel more realistic and impactful. However,

such heightened immersion could lead to a serious issue such as loss of critical distance. The space between the viewer and the screen allows the viewer to reflect upon and comprehend what they are viewing. This distance decreases as the user becomes part of the story world.

PLATFORM CAPITALISM AND THE STRUCTURING OF METAVERSE CINEMA

The findings demonstrate that the platform capitalism logic is highly prevalent in metaverse cinema, with large technology companies exercising their monopoly on production, distribution and technology. In addition to hosting films, they use data extraction, algorithmic governance and monetization techniques to shape films on these platforms. The data-driven storytelling in this manner contributes to a high level of personalization on one hand, but on the other side, it also means that films are part of a much larger surveillance and financial optimization ecosystem.

DISCUSSION

The findings of this study can be reviewed in light of the proposed theoretical framework in this study as well as the already existing theories. This signifies an important transformation in the essence of cinema. AI mediated metaverse based environments represent a major epistemological and ontological shift that reconceptualize cinema into an environmental, algorithmic and participatory system instead of simply being about technological progression.

The idea that media functions as extension of human senses (McLuhan, 1964) and the evolution of media into environments that influence our perceptions and experiences, can be understood within the concept of metaverse. The physicality of cinema has transitioned away from being only on-screen to now being an experiential space for people to enter and explore.

Similarly, the findings also support Manovic's (2001) assertion that database logic is a major cultural form in digital media. The trend towards procedural storytelling and real-time creation of content demonstrates a new kind of film narrative, one that is evolving from linear sequences into a database. Narrative elements act as building blocks for these new forms of storytelling put together by algorithms and users. This development is in complete contrast to the established principles of classical narrative cinema, such as causality, closure, and temporal continuity, as they have been replaced with new, fluid, adaptable, and even potentially endless narrative structures.

Additionally, spectatorship theory in the classical sense, in which the viewer is considered to be an external passive receiver of the film text, is not as relevant in immersive environments. The spectator can actively participate as well as be physically engaged with the body at many levels creating both a navigation and a construction of the narrative environment. This blurs the boundaries between the spectator and the text, thereby undermining the theoretical foundations of both apparatus theory and

spectator theory. The viewer no longer views a film from one visual point of view as a spectator rather, their experience becomes a function of both their interaction with that film's space, the movement they take while inside that environment and their physical presence within that narrative.

Together, these developments illustrate that cinema is evolving towards a post-cinematic state where cinema extends beyond the traditional boundaries of cinema as being viewed through projectors, creating time-based narratives and passively observed. Using both AI and platform ecosystems transforms cinema into a hybrid format that contains aspects of gaming, simulations and social interactions. The post-cinematic state is many more things than just a technological advancement, it is also a cultural and ideological change. Cinema's incorporation into platform ecosystems provides new ways to control, monetise and consume films consistent with the data-driven capitalism model. While the metaverse and artificial intelligence help create films with new methodologies they also transform how meaning is created, distributed or consumed.

CONCLUSION

The research contends that there is a major shift in how films are being made and experienced. With the advancement in technology such as AI, the use of virtual environments, platform-based infrastructures, and algorithm-based viewer experiences - cinematic experiences are becoming more

immersive. The AI-mediated immersive cinema framework developed in this research represents a significant contribution towards the integration of concepts from media theory, film theory, digital culture and immersion studies into a single coherent framework to conceptualize cinema as an ever-evolving system that produces collaboratively created narratives, viewers and creators. The research also provides a unified theoretical framework for understanding the new emerging post-cinematic world by combining previously separate bodies of knowledge into one encompassing framework.

The findings of this study reveals that the transition to participatory and non-linear narrative forms in film studies presents

significant challenges to established analytical frameworks of authorship, spectatorship and textuality. From a media ethics perspective, the increasing influence of algorithms on aesthetic experience presents numerous significant ethical concerns regarding authenticity, bias and the erosion of human creative agency. Further, the way cinema is built into platform ecosystems shows how data-driven systems and platform capitalism shape the creation and use of cultural products. It can be concluded that AI and metaverse convergence is not merely a new mode of cinematic expression, but rather a transformation in the definition of cinema itself. Now, cinema is an experience in which participants can enter into, interact with and create as one.

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