

## **Exploring use of Artificial Intelligence Tools in Film Production: A Qualitative Study**

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### **Abstract**

This research paper investigates the evolving influence of Artificial Intelligence (AI) tools on the cinematic production process, with a particular focus on their integration across pre-production, production, and post-production stages. Utilizing a qualitative textual analysis approach, the study explores how AI technologies are transforming creative workflows, augmenting technical efficiency, and redefining traditional notions of cinematic authorship and form. Drawing upon McLuhan's Medium Theory and Tetrad alongside David Bordwell's Formalist Film Theory, the paper adopts a triangulated theoretical framework to critically assess the formal, technological, and aesthetic implications of AI in filmmaking. Rather than treating AI merely as a neutral tool, this study foregrounds its role as a mediating force that restructures not only labor and authorship, but also the visual and narrative grammar of cinema. McLuhan's Tetrad facilitates a layered inquiry into what AI enhances, obsolesces, retrieves, and reverses within film production, while Bordwell's formalism allows for a close reading of how AI shapes narrative structure, stylistic consistency, and emotional engagement. Through a purposive sample of case studies and secondary textual sources—including AI-assisted trailers, visual effects, and narrative-driven films—the paper examines the capacities and constraints of AI within cinematic contexts. In addition to mapping technical capabilities and cinematic innovations, the research addresses urgent ethical questions related to creative agency, algorithmic bias, and authorship transparency. The study concludes that while AI offers unprecedented opportunities for formal innovation and production efficiency, its integration must be approached with critical awareness to preserve the foundational human elements of creativity, intuition, and cultural specificity in cinematic storytelling.

Keywords: Artificial Intelligence, Filmmaking, AI Tools, Autonomous Film Generation, Digital Cinematic Production, Computer-Generated Imagery (CGI)

### **Introduction**

The gradual evolution of Artificial Intelligence (AI) has profoundly reshaped numerous industries, revolutionizing traditional workflows and introducing innovative solutions to complex creative and logistical challenges. Within this transformative landscape, the film industry stands

as a dynamic site where technological advancement intersects with artistic expression. The integration of AI into filmmaking is no longer speculative—it is actively redefining every stage of the production pipeline, from script analysis and visualization to editing, visual effects, distribution, and even audience engagement (Sun, 2024). In recent years, AI has moved from peripheral experimentation to central functionality in contemporary cinema, significantly altering the creative workflow.

The film industry has long embraced the fusion of creativity and technology. From the early days of optical illusions and mechanical editing to the digital revolution, filmmakers have consistently leveraged emerging tools to enhance storytelling and streamline production (Ray, 2005). The emergence of AI continues this trajectory, introducing capabilities once confined to science fiction: intelligent scriptwriting assistants, automated editing software, deep learning-based visual effects, and predictive distribution models. AI systems can now not only assist but potentially autonomously generate narrative sequences or entire short films, contingent upon precise user input and strategic application of AI platforms.

This research paper investigates the transformative influence of AI tools on diverse aspects of film production, particularly focusing on how these technologies reshape the traditional creative workflow. By conducting a qualitative textual analysis and a comparative study of selected AI-integrated films and production processes, this study examines the functionality, efficiency, and aesthetic implications of these tools. It seeks to uncover how AI modifies cinematic form and meaning, offering new vocabularies of visual and narrative expression.

The analytical framework for this study draws on Medium Theory, especially Marshall McLuhan's Tetrad of Media Effects, which evaluates technological media in terms of what they enhance, obsolesce, retrieve, and reverse. This allows for a nuanced exploration of how AI, as a medium, restructures the filmic process and affects cultural production. To further ground the analysis in cinematic discourse, the paper also applies David Bordwell's Formalist Film Theory, which foregrounds the role of form—editing, mise-en scène, sound, and cinematography—in constructing cinematic meaning. Together, these frameworks offer a multidimensional perspective for critically engaging with the aesthetic, technical, and ethical implications of AI in contemporary filmmaking.

## **Research Objectives**

1. To critically examine the effectiveness and transformative impact of artificial intelligence (AI) tools on film production processes.
2. To identify and analyze key AI tools used across selected case studies in contemporary filmmaking.
3. To explore the role of AI in the three primary phases of filmmaking—pre-production, production, and post-production—through a medium-theoretical and formalist lens.
4. To evaluate the advantages, limitations, and ethical implications of AI integration in cinematic workflows.

## Literature review

The integration of Artificial Intelligence (AI) into the filmmaking industry has sparked significant academic interest in recent years, as scholars and practitioners examine its growing role across pre production, production, and post-production processes. AI technology, due to its capacity to automate tasks, analyze vast datasets, and predict patterns, has been rapidly developed and deployed across multiple industries—including media and entertainment (Sun, 2024). In the context of cinema, AI enhances efficiency and creativity through tools that support script generation, location scouting, casting, budgeting, editing, special effects, and audience analysis (Channa et al., 2024; Takyar, 2024).

Several studies highlight the functional benefits of AI in pre-production. AI-driven platforms such as Scriptbook offer predictive insights about script viability, while machine learning tools help refine storylines and generate script elements at scale (Sun, 2024). In production, AI assists directors and cinematographers by offering real-time suggestions on camera movements and lighting conditions, and by replicating live-action cinematographic techniques—such as framing, continuity, and blocking—in virtual environments (Swarnakar, 2024). These developments align with observations by Swarnakar (2024), who notes that AI technologies, including DALL-E 2 and emotion-based feedback systems, are reshaping production planning, actor performance guidance, and storyboard visualization.

Post-production processes have also undergone transformation through AI-enabled automation of editing, color grading, sound design, and visual effects generation. Tools such as DeepMotion and Ziva Dynamics now facilitate the creation of highly realistic animations and digital characters for film and gaming industries (Takyar, 2024). The use of AI in generating music and personalizing promotional content, such as trailers, further refines emotional targeting and viewer engagement (Chazen, n.d.; Swarnakar, 2024). Streaming giants like Netflix exemplify how machine learning and AI analytics enhance recommendation systems, audience segmentation, and even content creation based on viewer behavior (Netflix Research, n.d.).

While these technological advancements offer substantial operational benefits, scholars emphasize the need for ethical scrutiny. Anandraj and Aravind (2023) examine how AI reshapes workflows by improving creative speed and precision, yet also warn of risks related to data privacy, job displacement, and algorithmic bias. Similarly, Karpouzis (2024) points to the double-edged nature of AI in film, where democratization of tools coexists with threats to creative authorship and representational diversity. Chen (2025) supports this view by presenting case studies such as *The Lion King* (2019), showing that hyper realistic CGI achieved through AI can enhance spectacle but may lack the emotional nuance of traditional methods. Both Karpouzis and Chen converge on the argument that while AI significantly enhances productivity and storytelling potential, it cannot substitute the intuitive, imaginative faculties of the human mind, thus demanding ethical frameworks to safeguard artistic integrity.

This distinction between AI-driven efficiency and human creativity is underscored by historical and contemporary examples. The visionary filmmaking of K. Asif in *Mughal-e-Azam* (1960), notably through his innovative use of mirrors in the Sheesh Mahal sequence, demonstrates how pre-digital ingenuity created emotional resonance through visual design (Zankar, 2020). Similarly, Christopher Nolan's commitment to practical effects and analog filming in projects like *Oppenheimer*, *Interstellar*, and *Tenet* exemplifies a conscious resistance to digital overdependence in favor of tangible realism and conceptual depth (Shone, 2020). These auteurs remind us that while AI may enhance cinematic processes, it cannot fully replicate the richness of human experience and vision.

AI offers transformative potential for the filmmaking industry. It supports innovation, democratizes access to high-end tools, and opens new possibilities for immersive storytelling. At the same time, the rapid adoption of AI demands careful regulatory oversight to address ethical challenges surrounding authenticity, representation, authorship, and employment. Future research must continue to explore how filmmakers can use AI collaboratively—harnessing its strengths while preserving the core artistic and cultural values that define cinema.

## **Methodology**

Medium theory is a foundational framework for understanding how various communication technologies shape human perception and societal structures. McLuhan famously argued that “the medium is the message,” emphasizing that the medium through which content is delivered is as influential—if not more so—than the content itself (McLuhan, 1964). When applied to cinema, medium theory prompts an examination of the unique characteristics of film—its visual, auditory, and temporal dimensions—and how these affect narrative construction, audience interpretation, and cultural impact (Barsam & Monahan, 2013; Sobchack, 1992; Bordwell & Thompson, 2013).

In analyzing AI's integration into film production, medium theory offers a lens to understand not only the technological affordances of AI but also its ontological and epistemological implications for storytelling. For instance, AI-driven tools are now used for scriptwriting, editing, visual effects, and audience analysis. These interventions not only optimize production processes but also reconfigure aesthetic decisions and narrative logic. Medium theory encourages us to see AI not merely as a tool but as a transformative medium whose presence alters the form and content of the cinematic message. McLuhan's Tetrad of Media Effects—enhancement, obsolescence, retrieval, and reversal—further refines this analysis. The tetrad provides four key questions to explore the societal and aesthetic implications of any new medium, including AI: What does the medium enhance? What does it make obsolete? What does it retrieve that was previously obsolesced? What does it reverse into when pushed to the limits? (Motown Review, 2019). Complementing medium theory, David Bordwell's formalist approach to film theory places emphasis on analyzing the stylistic and narrative structures of cinema. Formalism asserts that meaning in film arises from the manipulation of formal elements—cinematography, mise-en-

scène, editing, and sound—rather than external socio-political contexts. Bordwell's work (along with Kristin Thompson) encourages close textual analysis, where the arrangement of shots, rhythm of editing, or spatial continuity contributes to meaning-making (Bordwell & Thompson, 2013; Stam, 2000). When analyzed through a formalist lens, AI becomes more than a production tool—it is a new kind of authorial force that reshapes the language of cinema. For instance, AI-assisted editing can create seamless transitions and rhythmically driven sequences that may differ significantly from human-made patterns. Similarly, AI-generated scripts or visuals might prioritize pattern recognition and audience-tested tropes, resulting in hyper-stylized but potentially less nuanced narratives.

Historical formalist movements like German Expressionism and Soviet Montage laid the groundwork for this approach, emphasizing visual metaphor, disjunction, and rhythm to convey psychological depth and ideological meaning. Directors such as Fritz Lang, Sergei Eisenstein, and later Stanley Kubrick and David Lynch employed formalist techniques to construct immersive, often disorienting viewing experiences. AI's entry into this lineage introduces a new variable—machines co-constructing form—potentially disrupting or extending these traditions (Stam, 2017; Hellerman, 2023). Together, medium theory, McLuhan's tetrad, and Bordwell's formalism offer a multifaceted framework for analyzing AI in film. Medium theory foregrounds the transformative nature of media technologies; McLuhan's tetrad reveals how AI restructures cinematic form and labor; and formalist theory provides tools to critique the aesthetic implications of this transformation. Understanding AI through this triangulated lens allows for a richer critical engagement with both its promises and pitfalls in contemporary film culture.

**Figure 1**

*The Tetrad of Media Effects*



The selection of case studies and textual materials in this study was guided by purposive sampling, appropriate for qualitative research that seeks depth over breadth. The chosen examples—such as Morgan (Watson-edited trailer), *Avengers: Endgame*, *Blade Runner 2049*, *Ex Machina*, *Sunspring*, and *The Mandalorian*—were strategically curated to reflect a spectrum of AI integration in contemporary cinema. These samples represent key moments where AI

intersects with distinct phases of the filmmaking process—pre-production visualization, narrative construction, VFX and post-production workflows, and trailer editing. Each selected text exhibits high relevance to the theoretical concerns of the study. From a McLuhanian perspective, these films and processes illustrate how AI, as a medium, enhances and transforms cinematic storytelling, retrieves earlier production logics, and risks reversing creative agency. From a formalist perspective, they offer fertile ground for examining how AI affects filmic structure, stylistic devices, and narrative logic. Furthermore, the inclusion of both high-budget Hollywood productions and experimental AI-generated content like *Sunspring* provides a balanced view of the industry's technological spectrum—from mainstream spectacle to algorithmic experimentation.

AI enhances the filmmaking process by amplifying efficiency and visualization: tools like ChatGPT, Midjourney, and Runway expedite script development, scene design, and visual effects, making complex narratives and imagery more accessible across budgetary scales (Radetzky, 2024; Monika et al., 2023). In doing so, AI obsolesces traditional, labor-intensive workflows, such as manual storyboarding or analog editing processes. It retrieves earlier cinematic experiments in automation and audience interactivity—as seen in *Mosaic* (Smith, 2007)—now reconfigured through advanced interactivity and real-time feedback. However, as McLuhan warns, when pushed to the extreme, a medium reverses into its opposite: the creative freedom AI offers may risk homogenizing artistic expression if overused, potentially dulling the individual filmmaker's vision and reducing formal innovation to algorithmic convention. AI's influence on film structure and style is both enabling and constraining. AI's use in continuity editing, VFX, and performance generation aligns with Bordwell's focus on formal precision and narrative clarity. Films like *Gemini Man* (Lee, 2019) and *The Lion King* (Favreau, 2019) demonstrate how AI contributes to maintaining visual consistency and lifelike motion, hallmarks of classical style. Yet, films like *Sunspring* (Sharp, 2016) and *Ex Machina* (Garland, 2014) challenge formal norms through AI-driven narratives or thematic reflections on the very logic that underpins film form—posing questions about authorship, coherence, and artificial emotion. Thus, while AI fortifies formal control and narrative experimentation, it simultaneously invites scrutiny about the limits of form when mediated by machine logic. AI is not merely a technological tool but a cultural force that reconfigures cinematic storytelling—extending its possibilities while reshaping its aesthetic and ethical foundations.

Hollywood cinema, when viewed through McLuhan's tetradic lens, functions not only as a site of technological enhancement but also as a mechanism to buffer or mitigate the societal shock of rapid innovation. The increasing integration of artificial intelligence (AI) into visual effects (VFX), as observed in films like *Avengers: Endgame* (Russo & Russo, 2019) and *Guardians of the Galaxy Vol. 2* (Gunn, 2017), enhances the scope and scale of cinematic spectacle, retrieves the classical awe associated with the cinematic sublime, and obsolesces traditional modes of *mise-en-scène* and star performance (Holliday, 2022). Yet, this very enhancement of technological realism through digital de-aging and facial reconstruction reverses into the uncanny—where hyperreal simulations threaten to hollow out the organic charisma of human

performance. From a formalist standpoint, as Bordwell might argue, these AI-driven effects augment the visual style and temporal coherence of blockbusters by ensuring continuity of character across decades without compromising narrative logic or stylistic unity. However, the heavy reliance on star imagery—digitally manipulated and re-contextualized—also indicates a shift where form becomes a performance of recognition, manipulating nostalgia and celebrity aura to preserve emotional connectivity in the face of technological detachment. Celebrity culture thus emerges as a stabilizing formal device, a kind of “anchor” within this rapidly transforming visual grammar. In this sense, AI in cinema is not merely a tool of narrative expansion, but a key player in the political economy of cinematic experience, where the synthetic reproduction of stars ensures continuity in the face of disruption, reaffirming audience trust and emotional investment in familiar forms.

The Morgan trailer, generated with the assistance of AI, stands as a significant milestone, emblematic of the transformative potential of algorithmic intervention in film promotion. This example enhances the efficiency of marketing workflows and retrieves earlier forms of promotional montage driven by rhythmic precision and emotional provocation. However, it simultaneously obsolesces the editor’s tactile and intuitive crafting of narrative arcs in trailers, and when taken to the extreme, reverses into formulaic storytelling, where the algorithm’s output risks emotional flattening or tonal homogeneity. The construction of a trailer is not merely a logistical task but a tightly controlled exercise in narrative compression, stylistic rhythm, and thematic resonance. While AI can process patterns, analyze audience reactions, and even suggest optimal cuts, it lacks the human sensibility required to capture the subtleties of mood, irony, or affective nuance that shape the viewer’s anticipatory relationship with the film. As such, the role of human creativity remains indispensable in curating emotion, tone, and narrative suggestion within trailers. The future of digital-era filmmaking will likely hinge on this hybrid model, where AI supports the formal scaffolding while the human filmmaker injects nuance, ambiguity, and originality—elements that no algorithm can fully replicate.

The concept of a fully or partially AI-generated film is no longer speculative fiction but an emerging reality shaped by the convergence of technological tools and creative ambition. Such a film project enhances the democratization of cinematic production by granting even novice creators access to sophisticated scriptwriting, visualization, editing, and sound design tools. It retrieves the spirit of early cinema’s experimentation, where innovation preceded standardization. At the same time, this process obsolesces conventional hierarchies in film crews—writers, storyboard artists, editors—by replacing them with generative AI platforms like ChatGPT, Midjourney, Runway, and ElevenLabs. However, if pushed too far, the practice may reverse into aesthetic stagnation or narrative incoherence, especially when devoid of human intuition and cultural sensitivity.

A partially AI-generated film may still adhere to classical norms of spatial continuity, character motivation, and narrative progression, provided the human creator strategically guides the AI. For instance, ChatGPT can structure story arcs with rising action and resolution; Midjourney or DALL·E 2 can provide shot compositions reflecting thematic motifs; Runway can apply visual

consistency in color grading and transitions; and AI-driven editing platforms can replicate montage structures consistent with genre expectations. However, Bordwell's emphasis on intentional stylistic variation—such as moments of narrative ambiguity, temporal rupture, or visual excess—remains a realm where human decision-making is crucial. The formal integrity of a film does not rest solely on structural coherence, but on the filmmaker's capacity to manipulate the medium's expressive potential. Hence, while AI may simulate cinematic grammar, it is the filmmaker who imbues form with meaning, disrupting or reinforcing conventions with artistic intent.

As the digital era evolves, the optimal cinematic model may lie in a synergistic partnership—where AI scaffolds production while the filmmaker orchestrates form, style, and theme. This alliance has the potential to expand the boundaries of authorship and aesthetics in film, not by replacing the filmmaker, but by reimagining their role in collaboration with machine intelligence.

## Figure 2

*In Captain America, Tony Stark coexists on screen with his digitally reconstructed younger counterpart.*



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## Figure 3

Stills from Guardians of the Galaxy showing use of AI tools.

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<sup>1</sup> Screenshot taken by the author from *Spider-Man: Far from Home* [Film]. (2019). Directed by Jon Watts. Columbia Pictures & Marvel Studios.



**Figure 4**

Stills from Captain Marvel BTS.

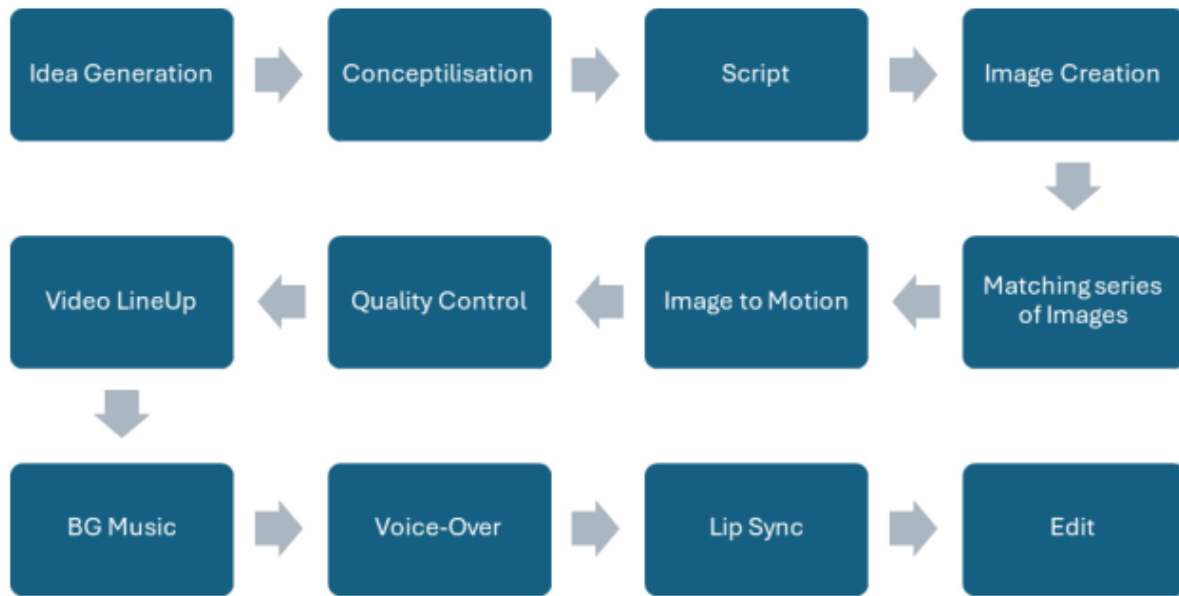


**Figure 5**

*Flowchart of procedure to create films through AI Tools*

<sup>2</sup> Comparison with original shot and reel shot showing how de-aging technology is used by Marvel Studios. Screenshot taken by the author from *Guardians of the Galaxy Vol. 2* [Film]. (2017). Directed by James Gunn. Marvel Studios.

<sup>3</sup> Yet another comparison between original and reel shots demonstrating the use of de-aging technology on Samuel L. Jackson by Marvel Studios. Screenshots taken by the author from *Captain Marvel* [Film]. (2019). Directed by Anna Boden & Ryan Fleck. Marvel Studios.



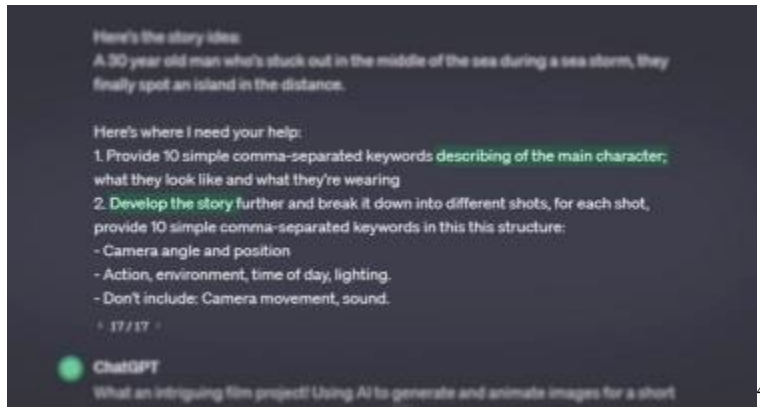
## Level 1: Planning and Scriptwriting

**Concept Development:** Before diving into AI, solidify the film's idea and concept.

**AI Script Writing Tools:** AI tools like ChatGPT, Gemini, or Gravity Write assist with scriptwriting. These tools can help structure your screenplay and generate ideas based on your prompts.

## Figure 8

*ChatGPT tool used for writing a detail screenplay*



## Level 2: Storyboarding with AI

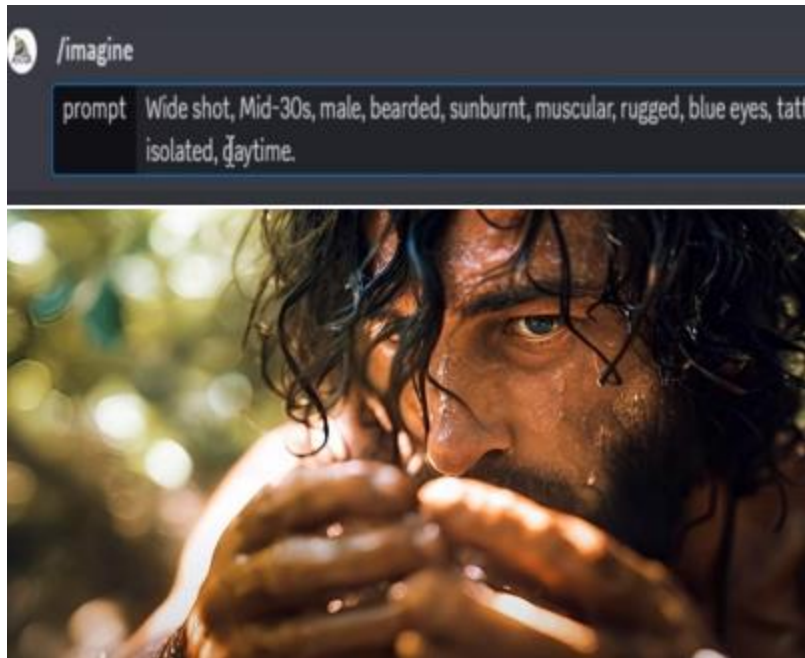
**Visualizing Your Script:** Utilize AI image generation tools like Midjourney, Playground AI, Clipdrop, or Stable Diffusion to create visuals based on your script. Provide detailed prompts including resolution, shot type, camera angle, color grading, lighting, character details, and background elements.

### Figure 9

*Midjourney Bot accepts text command to give result like this with multiple variation.*

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<sup>4</sup> Screenshot taken by the author from the ChatGPT interface, illustrating the use of AI to generate creative ideas, script drafts, and convert scripts into structured screenplays. ChatGPT, developed by OpenAI, supports writers and creators in the pre-production phase by providing context-aware narrative development.



### Level 3: Animation and Voiceover

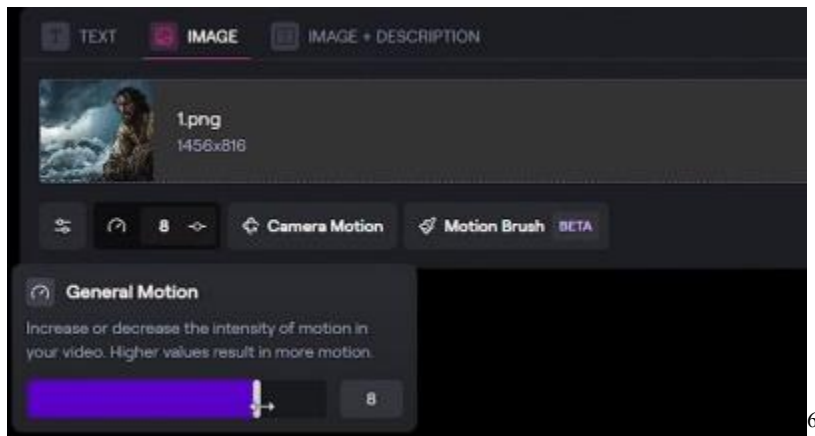
**Adding Motion:** Employ AI tools like Runway to generate animation by adding "in-betweens" to your still images, effectively transforming them into a video sequence.

### Figure 10

*Image showing how Gen-2 tools used to animate image generated by Midjourney*

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<sup>5</sup> Screenshot taken by the author from the Midjourney platform, demonstrating a text-to-image prompt interface and AI-generated visual output. Midjourney is an artificial intelligence tool capable of generating high-quality visuals based on descriptive textual input.



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**Voice Acting and Synchronization:** Leverage Eleven labs to create voice overs that match character tones and scene moods. Tools like LALAMO can then automatically synchronize the voice with characters' lip movements. For background music, explore AI tools like Pixabay to generate music that complements your specific scene.

**Figure 10**

*Interface of Eleven Labs*



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**Figure 11**

Edited using ClipChamp

<sup>6</sup> The animated video was created using Runway's Gen-2 platform, which enables text-to-video and image-to-video generation using artificial intelligence. The input image was generated via Midjourney, and then animated using Gen-2 to demonstrate dynamic scene synthesis from static visuals.

<sup>7</sup> Screenshot taken by the author from the ElevenLabs platform, demonstrating AI-generated text-to-speech functionality. ElevenLabs enables the creation of realistic voice-overs and character dialogues by converting written text into natural-sounding audio using advanced speech synthesis models.



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## Conclusion

This study has employed a qualitative textual analysis, guided by McLuhan's Medium Theory and Bordwell's Formalist Film Theory, to explore the evolving integration of Artificial Intelligence (AI) in contemporary filmmaking. Through purposive sampling and secondary textual sources—including analyses of trailers, film scenes, and production practices—the research has illuminated how AI technologies are reshaping the grammar of cinema, particularly in pre-production visualization, editing, and promotional strategies. Applying McLuhan's Tetrad has enabled us to conceptualize AI not merely as a tool but as a medium that extends, retrieves, obsolesces, and potentially reverses existing cinematic forms and workflows. Bordwell's formalist framework, in contrast, has foregrounded the structural and stylistic implications of AI on narrative coherence, spatial continuity, and visual rhythm.

Key findings underscore AI's capacity to enhance cinematic efficiency and innovation, as exemplified by projects like the Morgan trailer—where IBM's Watson was used to edit content based on emotional and thematic analysis (YouTube, 2023). Similarly, the automation of trailer cutting, sound design, and VFX has shown that AI can simulate the formal elements of film with increasing sophistication. However, despite these advancements, our analysis affirms the irreplaceable role of human creativity in imbuing film with emotional depth, cultural specificity, and narrative ambiguity—facets that remain largely outside the reach of algorithmic computation.

Moreover, ethical considerations regarding representation, authorship, and algorithmic bias persist as unresolved concerns. As AI continues to permeate cinematic production, it becomes

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<sup>8</sup> Screenshot taken by the author from the Clipchamp video editing platform, highlighting its AI-powered feature that enables seamless stitching of two video clips without manual transitions. Clipchamp integrates intuitive editing tools with artificial intelligence to enhance post-production efficiency.

imperative for scholars and practitioners alike to engage critically with these implications to ensure inclusive and ethically sound creative practices (Merchant, 2023).

In sum, this study contributes to a nuanced understanding of the interplay between AI technologies and the formal aesthetics of filmmaking. It calls for a continued exploration of AI not as a substitute for human authorship but as a collaborator—one that, when harmonized with human ingenuity, can expand the expressive potential of cinema without eroding its artistic soul. Future research may extend these insights by investigating audience reception, cross-cultural variations in AI use, and evolving definitions of cinematic authorship in the age of intelligent machines.

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