

The limits of disruption: AI and the persistence of VFX labour

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AD Narayan¹ , Angelique Nairn² ,
Justin Matthews² , and Duncan Caillard³

Abstract

Artificial intelligence (AI) and generative AI are increasingly framed as transformative forces in film production, particularly visual effects (VFX). Yet current debates often overstate their replacement of creative labour or integration into final-pixel production. This article examines how AI is understood, evaluated, and constrained in contemporary VFX practice through qualitative analysis of twelve interviews with VFX practitioners and twenty-six online news articles published between January and June 2025. Using reflexive thematic analysis, it identifies three themes: hype and hyperbole, efficiencies and employment, and actual application. Findings show that AI is valued mainly for ideation, rapid visualisation, prototyping, decision support, and selected technical tasks, while final production use remains limited by control, continuity, fidelity, intellectual property, data provenance, and pipeline compatibility. The article argues that AI adoption in VFX is a negotiated sociotechnical process, not a seamless technological rupture.

Keywords

creative labour, generative artificial intelligence, hype, film industry, technological influence

Introduction

Technology has long played a disruptive and generative role within the creative industries, reshaping practice and industrial organisation (Peterson, 1982). From the destabilising effects of digital piracy on music (Cusic et al., 2005) to the expansion of cinematic spectacle through motion capture (Tang et al., 2024), technological innovation has repeatedly reconfigured creative labour. More recently, artificial intelligence (AI) has emerged as a major site of contestation, provoking debate about creativity, labour, and authorship (Bender, 2025; Chow and Celis Bueno, 2025; Garcia, 2024; Lee, 2022). Discussions of AI in creative industries such as film often fall along a continuum,

¹School of Art & Design, Auckland University of Technology, Auckland City, New Zealand

²School of Communication Studies, Auckland University of Technology, Auckland City, New Zealand

³Arts and Cultural Management, School of Culture and Communication, Faculty of Arts, The University of Melbourne, Melbourne, Victoria, Australia

Corresponding author:

Angelique Nairn, School of Communication Studies, Auckland University of Technology, 55 Wellesley Street East, Auckland City, New Zealand.

Email: angelique.nairn@aut.ac.nz

from claims that it threatens creative labour to arguments framing it as an inevitable extension of production tools (Anantrasirichai and Bull, 2022; Erickson, 2024; Pearson, 2022). Much scholarship emphasises risks of displacement and deskilling (Erickson, 2024).

In the film industry, especially visual effects (VFX), concern over AI and generative artificial intelligence (GenAI) has been amplified by high-profile public commentary. Some practitioners stress regulatory safeguards around image rights and likeness (Tamasco, 2026), while others raise ethical and creative concerns about synthetic performers and generative media (Pulver, 2025). Generative AI is often framed as an unregulated frontier technology, reflecting uncertainty about creative and industrial implications (Leffler, 2025). Labour actions by the Writers Guild of America and SAG AFTRA further show how GenAI has been positioned, particularly by above-the-line workers, as a threat to creativity, job security, and professional autonomy (Yamazaki, 2024). At the same time, GenAI is already being integrated into film production. Studios are experimenting with AI-assisted pipelines (Yang, 2025), while legal disputes over copyright and training data reveal unresolved tensions between innovation and intellectual property. AI-driven techniques have been used in high-profile films for de-aging and digital manipulation, alongside growing investment in proprietary tools (Morris, 2025). For example, *Emilia Perez* (2024) and *The Brutalist* (2024) used AI to modify actors' voices, while *Here* (2024) and *The Irishman* (2019) employed de-aging technologies (Barber, 2024; Morris, 2025). Such developments indicate that AI filmmaking is no longer speculative and is now embedded within contemporary production.

Despite growing attention, the role of AI within VFX remains underexamined. Existing research has largely prioritised technical affordances over practitioner perspectives (Dahlberg et al., 2019; Lee et al., 2025; Liu et al., 2025). Our previous pilot study addressed that gap by examining how VFX artists understood the creative and industrial implications of GenAI integration. Participants expressed cautious optimism about potential gains in efficiency and workflow, while also voicing concerns about copyright infringement, reputational risk, and financial precarity in an already competitive and under-resourced sector (Narayan et al., 2022). Consistent with findings from other creative fields (Bhattacharya, 2023; Chow, 2020; Matthews et al., 2023), participants argued that AI could not meaningfully replace human expertise or creative judgment.

Our earlier research took place in 2023 (but the article is listed as 2022 due to the processes of the publisher) before the release of advanced generative video tools such as OpenAI's Sora and Adobe's Firefly, marking a major shift in the technological landscape. The present article revisits AI in VFX at a moment of accelerated change, combining analysis of contemporary media texts with interviews from VFX practitioners. Rather than focusing only on attitudes, the study examines how AI is understood, negotiated, and constrained within everyday production practice. VFX offers a valuable case because the sector remains largely non-unionised, deeply embedded in globalised production networks, and structurally vulnerable to cost-cutting pressures (Curtin and Vanderhoef, 2015; Parker and Cox, 2013). As a result, technological change is often experienced as inevitable rather than chosen. Drawing together practitioner interviews and online media coverage, the study foregrounds the gap between promotional and trade-press narratives of AI-enabled acceleration, cost reduction, and automation, and the industrial, creative, and labour conditions shaping AI uptake in practice.

Literature review

Verisimilitude and VFX

VFX are widely understood as digitally mediated alterations and enhancements of moving images that alter, extend, or construct screen reality (Dinur, 2023; Rüling and Duymedjian, 2014).

Although VFX work is most often associated with post-production, planning and execution now span pre-production and production workflows, reflecting the centrality of digital interventions to contemporary filmmaking (Giralt, 2017; Rüling and Duymedjian, 2014). VFX includes a broad range of practices, including computer-generated imagery (CGI), enhancement or replacement of shot elements, and seamless integration of artificial and live-action footage in ways audiences cannot detect (Rüling and Duymedjian, 2014; Venkatasawmy, 2012). Historically, VFX evolved from cost-saving substitutions for impractical or dangerous physical effects into a dominant component of screen production (Rüling and Duymedjian, 2014). Venkatasawmy (2012) traces that shift, noting that VFX initially served to create the unfilmable, enhance spectacle, or conceal technological interventions, but by the late twentieth century, had become integral to Hollywood's production model.

As VFX became integral to mainstream screen production, success increasingly hinged on realism and verisimilitude. Across scholarly and industrial discourse, VFX are often evaluated according to their capacity to appear indistinguishable from footage captured directly by the camera or otherwise seamlessly integrated into the visual, narrative, and generic world of a film or television text (Dinur, 2023; Giralt, 2017). Demand for photorealism shapes the standards used to assess VFX quality, though this should not be understood as a claim that VFX simply make images 'more real'. Even where VFX produce fantastical creatures, environments, or effects, their success depends on whether they feel credible within the aesthetic and material logic of the screen world they inhabit (Essien et al., 2025). Under such conditions, VFX production is best characterised as a form of 'constrained creativity' (Rüling and Duymedjian, 2014: 100). Rüling and Duymedjian (2014) argue that VFX work requires continual innovation and problem-solving, yet is constrained by narrative requirements, directorial vision, and, as Curtin and Vanderhoef (2015) note, the technical and financial limits of schedules and budgets. As a result, VFX labour is 'highly fragmented' and collaborative, distributed across specialised roles such as modellers, animators, riggers, lighting artists, and composers, who coordinate through complex pipelines and proprietary software systems (Rüling and Duymedjian, 2014: 100). Digital assets produced within such workflows are rarely conceived independently of the material world. Instead, they are derived from photographic reference, physical textures, biological forms, or digital libraries, reinforcing an industry-wide commitment to simulating physical reality rather than departing from it (Rüling and Duymedjian, 2014).

Jones (2023) argues that VFX quality is often associated with seamlessness, creating a paradox in which highly labour-intensive work can become culturally illegible. This does not mean that VFX are always unnoticed or aesthetically insignificant. Films such as *Star Wars*, for instance, demonstrate how VFX can be central to a film's spectacle, identity, and cultural memory. However, even when VFX are highly visible as spectacle, the specific labour involved in producing them is not always easy to delineate. Effective VFX are frequently integrated into the narrative and visual world of a film so thoroughly that, for many viewers, it is difficult to determine where the physical set, live-action performance, digital compositing, and post-production intervention begin and end. In this sense, VFX share a broader problem common to many forms of behind-the-scenes screen labour: they help produce the coherence of the finished image, yet this very coherence can obscure the workers who make it possible. This aesthetic and technical indistinguishability is reinforced by the industrial organisation of VFX production. Although VFX are central to contemporary filmmaking, often accounting for a substantial proportion of production budgets and screen time, the labour itself is frequently structured through outsourcing, project-based employment, unpaid overtime, and limited union representation (Curtin and Vanderhoef, 2015; Narayan et al., 2022; Yuan et al., 2015). These conditions do not merely affect how VFX are produced; they also shape how new technologies are understood and received within the industry, particularly

when innovation is celebrated while the labour sustaining it remains hidden (Curtin and Vanderhoef, 2015; Jones, 2023; Narayan et al., 2022).

Understanding artificial intelligence and its influence on the VFX industry

AI refers to computational systems designed to perform tasks associated with human cognition, including perception, reasoning, pattern recognition, and decision-making (Janiesch et al., 2021). Within that category, machine learning (ML) describes techniques that enable systems to learn from data and improve performance through experience rather than explicit rule-based programming (Chow, 2020; Janiesch et al., 2021). ML systems identify patterns in large datasets, allowing them to generalise from experience and adapt to new inputs over time (Janiesch et al., 2021). GenAI describes models capable of producing novel outputs such as images, text, or video based on learned statistical patterns (Erickson, 2024; Narayan et al., 2022). Maintaining distinctions between AI, ML, and GenAI remains important. Brown (2021) and Narayan et al. (2022) caution that collapsing these categories risks overstating technological autonomy and obscuring the human labour involved in training, curating, and supervising systems.

AI's influence within VFX cannot be separated from the production cultures, workflows, software infrastructures, and labour relations through which these tools become operational. Socio-technical approaches understand technological systems as arrangements of technical components and social elements, including workers, organisations, institutional contexts, and the practices through which systems are developed and used (Appelbaum, 1997; Sartori and Theodorou, 2022). In relation to AI, this means attending to the interaction between social actors and technological processes, rather than centring either human intention or technological autonomy (Holton and Boyd, 2021; Makarius et al., 2020). From this perspective, AI and GenAI in VFX do not function as autonomous creative agents, but as tools embedded within specific industrial and artistic systems. They operate through datasets, pipelines, artistic judgement, production schedules, studio priorities, and the interpretive and corrective labour required to transform machine-generated outputs into usable screen images (Anantrasirichai and Bull, 2022; Demsar et al., 2025; Erickson, 2024; Narayan et al., 2022).

The socio-technical framing is noteworthy because discussions of AI in the VFX industry often situate adoption within a longer history of technological experimentation, optimisation, and labour precarity in screen production (Jones, 2023; Narayan et al., 2022). AI is frequently framed as an extension of existing computational practices rather than a rupture. Chow (2020: 194), for example, notes that film production has already incorporated AI in 'small and significant ways', including object recognition, image manipulation, animation, and special effects generation. Within VFX, AI and ML have long supported tasks such as denoising, rotoscoping, object removal, inpainting, super-scaling, and rendering optimisation (Dahlberg et al., 2019; Singh et al., 2023; Verma and Haider, 2024). These applications suggest that AI's significance lies not only in the novelty of generative tools, but also in how such tools intensify, reorganise, or automate practices already embedded within VFX workflows.

AI systems are particularly effective at low-level image processing and pattern recognition, especially when trained on the large datasets produced by VFX pipelines. Dahlberg et al. (2019) show that machine-learning denoisers reduce render times while preserving image quality, enabling faster iteration. Kleiman et al. (2019: 1) argue that deep learning techniques relieve artists of 'menial work' rather than replacing skilled labour, supporting a view of AI as assistive technology that enhances productivity while leaving creative decision-making intact (Erickson, 2024). However, the creative implications of automation remain ambivalent. Scholars warn that automation can

constrain creativity by standardising outputs and narrowing aesthetic possibilities (Atkinson and Baker, 2023), while Chow (2020) suggests that predictive analytics and data-driven decision-making may privilege established formulas over experimentation, reinforcing inequalities by favouring familiar genres, stars, and visual styles. In VFX-heavy productions, these tendencies are not produced by AI alone but emerge from the interaction between automated systems and existing industrial priorities. Where realism and verisimilitude remain dominant evaluative criteria (Dinur, 2023; Rüling and Duymedjian, 2014), reliance on historical data and automated optimisation may reproduce familiar aesthetic norms, particularly when AI is used to accelerate established workflows rather than expand creative exploration (Narayan et al., 2022).

Such emphasis on acceleration connects aesthetic questions to labour and production conditions. Efficiency gains are especially attractive in an industry shaped by cost pressures, compressed timelines, and globalised labour markets (Curtin and Vanderhoef, 2015; Yuan et al., 2015). Yet empirical research shows that AI-assisted production remains labour-intensive, requiring expertise in data selection, cleaning, parameter tuning, and output curation (Erickson, 2024). From a socio-technical perspective, these labour demands are not secondary to technological implementation, but part of the system through which AI becomes operational, since work design depends on the joint organisation of social and technical processes (Appelbaum, 1997; Makarius et al., 2020). In this sense, efficiencies tend to arise through early-stage ideation, previsualisation, and repetitive technical processes rather than through the wholesale replacement of creative roles (Amankwah-Amoah et al., 2024; Anantrasirichai and Bull, 2022; Erickson, 2024; Narayan et al., 2022). Although industry discourse often frames GenAI as a threat to employment (Cho, 2024), evidence indicates that human expertise remains essential for aesthetic coherence, narrative intent, and photorealistic credibility, particularly given AI systems' limitations in interpreting narrative meaning, emotional nuance, and stylistic consistency (Brown, 2021; Narayan et al., 2022).

As AI and GenAI tools become more prominent in industry discourse and marketing, the labour underpinning them becomes less visible. Narayan et al. (2022) argue that such dynamics mirror long-standing conditions within VFX, where seamless spectacle conceals creative work. AI, therefore, intensifies existing patterns of invisibility. Such conditions raise ethical and legal concerns around authorship, intellectual property, and data use. VFX artists have expressed concern that their work may be incorporated into training datasets without consent, attribution, or compensation, potentially undermining creative ownership and future employment (Narayan et al., 2022). These concerns align with broader industry disputes, including the previously mentioned 2023 Writers Guild of America and SAG-AFTRA strikes, which highlighted fears that AI could enable the extraction of creative labour while eroding autonomy (Yamazaki, 2024). Although VFX artists occupy a distinct industrial position, these debates reflect wider concerns across screen production regarding ownership, control, and the future of creative work.

Method

This study adopts a qualitative, exploratory approach to examine AI in VFX during a period of rapid technological change. The research combines analysis of contemporary online news texts with interviews documenting the perspectives of VFX practitioners. In addition to examining industry attitudes toward AI, the study investigates how generative AI is encountered, evaluated, and constrained within VFX production, foregrounding the gap between discursive promise and production reality. Drawing on media coverage and practitioner accounts, the analysis considers how meanings around AI are produced through professional practice, media discourse, and lived experience. Building on earlier research conducted in 2023, the study remains open to emergent

Table 1. Information on interviewees.

Pseudonym	Level of experience	Freelance/studio in-house
Tobias	Junior	Sudio in-house
Julian	Senior/producer	VFX Studio Owner
Priya	Senior	Studio in-house
Marcus	Junior	Studio in-house
Rohan	Mid	Freelance
Vincent	Mid	Freelance
Maya	Mid	Freelance/studio contract
Noor	Supervisor/senior compositor	Studio in-house
Farah	Senior	Freelance
Daniel	Senior	Studio in house
Elena	Mid	Freelance
Isabelle	Senior	Freelance

themes and unanticipated perspectives, recognising that understandings of AI are neither stable nor uniform. Guided by an interpretivist framework, meaning is treated as socially constructed and shaped by the conditions under which VFX artists work (Willis et al., 2007). The research offers situated insights into how generative AI is framed, negotiated, and limited in practice, highlighting tensions between technological promise, creative labour, and the material realities of VFX production. Ethics approval was granted by Auckland University of Technology Ethics Committee (AUTEC) (24/29), and all interviewees provided informed consent.

Although the initial design prioritised interviews with VFX practitioners, recruitment proved challenging. Many potential participants expressed frustration with current industry conditions and felt broader dissatisfaction would shape their responses. As a result, twelve semi-structured interviews were conducted online, lasting between 30 min and one hour. Participants were experienced VFX artists credited on Hollywood productions, forming a globally distributed sample (see Table 1 for demographic profile information). They had between one and more than 25 years of industry experience and were expected to have engaged with AI tools in professional practice. Semi-structured interviews enabled detailed exploration of complex technological and social phenomena while allowing follow-up questions to clarify responses (Adams, 2015). All interviews were recorded, transcribed, and reviewed by the primary researcher before being shared with the research team. Pseudonyms are used to ensure anonymity. Limited participation also highlighted how AI is encountered within broader industrial pressures rather than as a discrete technological issue. The study was expanded to include online news articles published between January and June 2025. This addition enabled examination of how generative AI is framed within public industry discourse. Articles were identified through Google News searches using the terms ‘VFX’, ‘artificial intelligence’, and ‘film’. The search returned 36 items, refined to 26 after removing duplicates, press releases, and content from non-verified platforms. The final corpus included publications such as *The Hollywood Reporter*, *Variety*, *VFX Voice*, *Deadline*, *Fast Company*, and *The Independent*.¹

Combining interview data with news coverage enabled analysis across lived production contexts and broader industry discourse. Interviews provided insight into how AI is encountered and evaluated in everyday creative practice, while news articles revealed how technologies are framed, justified, and contested at an industry level. Analysing both datasets together allowed identification of points of convergence and disjuncture between practitioner experience and media narratives. The approach also highlights how claims about innovation, efficiency, and transformation circulate

within media discourse and how such claims are taken up, resisted, or reframed by VFX artists working under specific industrial conditions.

Both datasets were analysed using reflexive thematic analysis following Braun and Clarke (2006; Braun et al., 2023). Within the news corpus, attention focused on quoted material from VFX practitioners, industry representatives, and AI specialists. This enabled examination of how generative AI is discussed by high-profile figures alongside working practitioners whose perspectives reflect everyday production realities. Reflexive thematic analysis was selected for flexibility and its capacity to support both descriptive and interpretive analysis (Braun et al., 2023). At the semantic level, coding examined how AI was described, evaluated, and incorporated into workflows. At the latent level, analysis explored how broader narratives around creativity, labour, automation, and technological change shaped understandings of AI's role in film and VFX production.

The analytical process followed the six-phase framework outlined by Braun and Clarke (2006, 2013). The research team familiarised themselves with the dataset through repeated engagement with transcripts, recordings, and news articles, focusing on moments of evaluation, tension, and constraint. Initial coding was conducted independently and then compared collectively, requiring discussion of overlap and divergence (Byrne, 2022). An initial set of 29 codes was refined into seven provisional themes and then consolidated into three overarching themes that structure the analysis. Throughout the process, the team engaged in reflexive practice (Braun et al., 2023), critically examining how prior knowledge and assumptions about AI and creative labour shaped interpretation.

The three main themes identified through the process were *Hype and Hyperbole*, *Efficiencies and Employment*, and *Actual Application*.

Results

Theme 1: Hype and hyperbole

The first theme, hype and hyperbole, captures how the perceived value of AI in the VFX industry is constructed across media coverage and practitioner interviews. Central is a gap between expectations of what AI should deliver and the lived experiences of artists working with, or alongside, such tools. Public-facing commentary from some studios, executives, AI companies, and trade press sources often frames GenAI as transformative, particularly through claims about automation, speed, and cost reduction. Participant accounts, however, suggest that its current role in everyday VFX work remains uneven, selective, and at times speculative.

Although less pronounced in media articles, VFX studios, producers, and AI researchers emphasised AI's potential value. Ed Ulbrich of MoonValley described 'AI-powered filmmaking tools are like jet fuel for creativity' (Welk, 2025), while Lala Gavgavian of Digital Domain noted that 'AI tools are already making strides in automating rotoscoping, keying and motion capture cleanup, which are traditionally labour-intensive and time-consuming tasks' (McCullaugh, 2025). These promotional and executive accounts position AI as accelerating production while freeing artists from repetitive labour. Some participants echoed this view when discussing potential relief from repetitive work. Isabelle explained that 'AI has gotten good enough that it can get you about 75 percent of the way there [with rotoscoping] [...] and a talented artist can refine the rest'. These perspectives frame AI as a support tool capable of handling labour-intensive processes such as rotoscoping, tracking, and paint work, aligning with research that links GenAI adoption to increased productivity and motivation (Bender, 2025; Erickson, 2024; Pearson, 2022; Verma and Haider, 2024).

However, such optimism was experienced unevenly by those performing the work. While senior figures argued that ‘Automation of repetitive and non-creative tasks such as rotoscoping and tracking will significantly reduce the time and effort required for these laborious processes...’ (Neishaw Ali cited in McCullaugh, 2025), entry-level artists reported little change. Tobias noted, ‘I hear people saying juniors won’t need to do roto anymore, or that everything will be automated, and then I look at my day and I’m still rotoing’. Another junior staff member, Marcus, similarly stated, ‘I’m still just doing roto’. These accounts suggest a perceived disconnect between promotional claims about the automation of repetitive tasks and the everyday experience of junior artists still performing that labour. This does not necessarily mean that industry claims are simply inaccurate; they may reflect aspirational accounts of where senior figures imagine VFX workflows moving, or developments that have not yet been meaningfully integrated across all levels of production. That said, for junior artists, the gap between these narratives and their own labour conditions produced what could be construed as a sense of professional ‘limbo’ where expectations of obsolescence coexist with unchanged labour conditions.

Such uncertainty can contribute to confusion and reduced confidence. Research suggests that ambiguity can undermine motivation in creative work, particularly where tolerance for uncertainty is low (Gotsi et al., 2010; Hesmondhalgh and Baker, 2008; Rowlands and Handy, 2012). Tobias described how the ‘range of opinions actually makes it harder to know what to think. If they all don’t all agree, how am I supposed to be confident?’ Rather than offering clarity, competing narratives amplified precarity already associated with creative industries (Hesmondhalgh and Baker, 2010). Attempts to engage with AI did not always resolve this tension. Marcus, despite trying to upskill, remained unconvinced that ‘it’s useful’ or that investing time in learning such tools was worthwhile. Even industry leaders expressed caution. Mark Finch, Chief Technology Officer at Vicon, warned that artists risk spending time mastering tools that are ‘still finding their feet’ (as cited in McCullaugh, 2025). These positions do not suggest that GenAI has no potential value for VFX, but that its usefulness remains difficult to assess while the industry is still determining how such tools can be integrated into tightly structured production timelines, legal frameworks, quality-control expectations, and established creative pipelines (Curtin and Vanderhoef, 2015; Yuan et al., 2015). The caution and, in some cases, frustration expressed by participants, therefore, point to ongoing boundary work around where human judgement, machine assistance, and collaborative human-machine processes are most appropriate within VFX. Until those boundaries are more clearly established, claims about AI’s value are likely to remain unevenly experienced, producing ambiguity for artists who are encouraged to prepare for technological change while its practical role in their everyday work remains uncertain.

Participants also highlighted technical limitations that restricted practical use. Rohan described how ‘You try to use it in a sequence and suddenly characters drift, lighting doesn’t match, edges jitter. It’s pointless noise’, while Vincent argued that ‘Generative models don’t have a persistent internal idea of a character, environment, or scene... that’s poison for QC’. These limitations are significant in a field where VFX quality continues to be judged according to seamlessness, verisimilitude, and the capacity of an effect to remain coherent within the visual and narrative world of a film or television text (Dinur, 2023; Giralt, 2017; Rüling and Duymedjian, 2014). Even where VFX produce fantastical or impossible images, they must still adhere to the aesthetic and material logic of the screen world they inhabit. The character drift, mismatched lighting, unstable edges, or inconsistent environments that artists observed while using GenAI tools can disrupt technical workflow and undermine the credibility and continuity that VFX artists are tasked with maintaining. It led participants to note that although ‘AI was brilliant for speed and alignment’, outputs required significant revision. Julian explained that AI-generated work helped secure initial approval, but

‘traditional artists had to rebuild everything properly in Ellis, ZBrush, Houdini, and texture it in Substance’. Rather than reducing labour, this process ‘created more work downstream’, with artists effectively validating and reconstructing AI outputs. Such findings align with critiques from VFX workers who resist following AI-generated material at the expense of creative autonomy (Narayan et al., 2022).

Where AI did provide value was often at higher levels of decision-making rather than in replacing labour. Julian, a studio owner, noted:

Technical blockers get solved quicker because I can sanity-check ideas before pulling an artist off another task. I was talking to [redacted], and we unsure whether a shot should be solved with a 2.5D comp in Nuke or a full CG rebuild in Unreal, but I can prototype the logic mentally and technically much faster with AI support given the constraints we knew the plates had. That means fewer false starts.²

Here, AI’s value lies less in replacing a discrete task than in reconfiguring how technical decisions are tested, sequenced, and justified within the pipeline. Julian’s position also reveals that there is not a unified scepticism toward AI, but a differentiated pattern of use: junior artists described limited change in repetitive shot-level labour, while senior or supervisory participants were more likely to identify value in AI as a tool for testing approaches, reducing false starts, or supporting early decision-making. Observed then, is that routine work persists, but that senior practitioners are seeing that AI can be used to ‘kill the wrong approach’ (Priya) earlier in the pipeline. However, such use introduces new demands. Artists must develop ‘new instincts’ and learn ‘how to recognise situations where ML helps and situations where it absolutely doesn’t’ (Noor). As Marcus’ comments suggest, a cyclical uncertainty emerges. Artists may feel pressure to learn AI tools due to surrounding hype yet remain unsure whether those tools will integrate meaningfully into workflows.

Theme 2: *Efficiencies and employment*

The second theme, efficiencies and employment, brings together trade press and executive discourse that frames AI as a mechanism for cost control, production acceleration, and economic survival in the film industry, often positioned as a form of democratisation within VFX. Across the media coverage, AI is frequently associated with cost savings and increased production speed. Industry executives frame such efficiencies as evidence of disruptive potential. Ted Sarandos of Netflix, for example, argued that the de-aging effects in *Pedro Páramo* were achieved at a fraction of the cost of comparable techniques used in *The Irishman*, noting that the entire budget of the newer film was roughly equivalent to the VFX costs of the older project (Hayes, 2025). Nikola Todorovic of Wonder Dynamics similarly explained that his company’s technology aims to enable visually ambitious storytelling at lower budgets while accelerating parts of the VFX pipeline (Hogg, 2025). Rohan Sahai of OpenAI also suggested that production companies are using tools such as Sora to streamline workflows and reduce costs (Cho, 2025). These claims emerge alongside broader industrial pressures, including declining cinema attendance, corporate consolidation, and competition among streaming platforms. Read socio-technically, efficiency is therefore not simply a feature of the tool, but an outcome shaped by the industrial conditions, production infrastructures, and labour arrangements into which AI is introduced.

In some industry and trade press accounts, efficiency claims are extended into narratives of democratisation, where AI is framed as lowering barriers to entry and expanding participation in creative production. If advanced effects can be produced more quickly and cheaply, more creators may access techniques once limited to major studios. Christopher Nichols of Chaos anticipates

‘fewer artists per project but more projects in general’, as AI reduces production costs (as cited in McCullaugh, 2025). Todorovic similarly emphasises enabling filmmakers to tell large-scale stories on lower budgets (Hogg, 2025). These perspectives position AI as an infrastructural shift that could broaden participation in VFX-driven storytelling. However, such claims risk conflating access to tools with access to labour markets. While AI technologies may be increasingly available, participation in professional VFX production still depends on specialised knowledge of workflows, pipelines, and collaboration (Narayan et al., 2022). As senior practitioners, Noor and Isabelle’s comments also suggest an attachment to established standards of quality and professional judgement developed through industry experience. Noor noted, ‘image literacy and judgement’ remain essential. Isabelle likewise emphasised that AI cannot replace ‘deep creative judgment, temporal continuity, or artistic intent’. Their reservations can be read not simply as resistance to new tools, but as concern that wider access to AI may not, on its own, reproduce the evaluative standards expected in professional VFX work. Although tools may become more accessible, the skills required to use them effectively remain an important consideration. The distinction is important because access to AI does not automatically translate into participation in VFX work; participation still depends on the social and technical competencies through which professional pipelines are organised.

Interviewees generally agreed that AI can generate efficiencies in specific contexts, particularly during early-stage iteration, aesthetic experimentation, or rapid prototyping of characters and concepts. However, these efficiencies did not translate into wholesale labour replacement. This view aligns with industry figures such as Roberto Legato of Stability AI, who described AI in VFX as a ‘fusion of AI and filmmaking as an evolution of creative storytelling, designed to elevate rather than substitute for artistry’ (as cited in FXguide, 2025). Scholarly work similarly suggests that sustained cost savings are unlikely to result from staff displacement, given the ongoing need for human oversight (Bender, 2025; Erickson, 2024; Pedota et al., 2025). Participants likewise emphasised that AI systems struggle to interpret creative intent. Maya explained, ‘Half my job is interpreting vague notes. “Make it cooler but warmer.” ... Those notes only work because humans understand context’, while Vincent added that ‘Generative tools don’t understand notes. They don’t understand subtext’. AI’s relationship to VFX labour may be less about the disappearance of artists than a potential reworking of where their expertise is located within the production process. Artists are still required to interpret, guide, constrain, and evaluate AI outputs, meaning that any efficiencies depend on their knowledge and experience. In this sense, AI’s value is produced through human-machine coordination, where artists’ interpretive and evaluative labour remains central to making outputs usable within production. This may point toward an incremental reshaping of the VFX artist’s role, in which creative judgment, quality control, and the ability to determine when machine-generated material is useful become increasingly important. Such a shift does not resolve the invisibility or precarity of VFX labour, nor does it establish a clear future for the pipeline. It does, however, suggest that the boundaries between technical execution, creative decision-making, and evaluative oversight can, and are being renegotiated, because of the opportunities and challenges posed by AI.

Environmental concerns also emerged across both media coverage and interviews. Some participants and industry figures argued for a ‘clean’ and ethically responsible approach to AI adoption (Goodfellow, 2025; Szalai, 2025a). This framing positions AI as an environmental issue alongside labour and creativity, aligning with broader sustainability debates (Chauhan et al., 2024; van Wynsberghe, 2021; Yu et al., 2024). Lauri Sanders, director and head of the AI Taskforce at ABRACA, argued that ‘The computational power required to train and use generative AI models demands a staggering amount of electricity and water, which directly strains municipal water supplies and disrupts local ecosystems’ (as cited in Goodfellow, 2025). The BFI report similarly noted

that ‘GenAI models require significant computational resources, resulting in high energy consumption and associated carbon emissions’ (Szalai, 2025a). These concerns align with research highlighting how AI can generate environmental harm through energy use and resource extraction. However, this concern was not universally shared. Daniel suggested that the VFX industry already has a significant carbon footprint due to its reliance on technology, and that AI could potentially reduce environmental impact by saving ‘time, energy, and electricity’. This divergence reflects a tension between critical accounts of AI’s environmental costs and practitioner perspectives that frame AI as a tool for optimisation within existing production systems.

Theme 3: Actual application

The third theme, actual application, examines how AI is currently integrated into the VFX industry and where misconceptions about its use emerge. Across both media texts and interviews, there was broad agreement that AI is ‘inevitable’, yet its application remains highly niche and constrained. Inevitability does not equate to ubiquity.

Media coverage consistently framed AI as a tool used in pre-production or in specific technical stages rather than for final asset creation. Examples included AI-generated ‘moving mood boards’ for visualisation (Diaz, 2025), ‘digital renderings’ used as concept images (Jones and O’Falt, 2025), insertion of elements such as smoke or reflections into scenes (Nuñez, 2025), and production planning or resource management (McCullaugh, 2025). Even among industry leaders, AI was positioned as assistive rather than substitutive. Both media discourse and practitioner accounts indicated that AI is rarely used for final creative outputs. Instead, it functions as an exploratory tool, producing provisional results that require further development. Participants attributed this partly to the limited control afforded by generative outputs. Isabelle explained that ‘in big studios, everything is built layer by layer. You can’t adjust one element without breaking the rest. AI-generated images are baked in. You lose fine control, and that’s unacceptable in production’. Vincent made a similar point, noting that ‘With generative outputs, if the sky looks good but the mid-ground is wrong, you don’t fix the mid-ground. You have to regenerate everything and hope it behaves. It’s the equivalent of Russian roulette’. GenAI’s limitations are perceived not only aesthetically but also procedurally, since final VFX production depends on the ability to isolate, adjust, and refine individual elements within a controlled pipeline. Inconsistencies in lighting, composition, spatial continuity, or character detail can also challenge the realism and verisimilitude expected of finished VFX work, making it unsurprising that both media coverage and participants tended to disassociate GenAI from final production outputs. GenAI’s current value, therefore, appears to lie less in autonomous image production than in specific points of human-machine coordination, where outputs can be tested, interpreted, and either refined or discarded within existing workflows (Matthews et al., 2026).

These limits are reinforced by concerns around copyright and intellectual property. Across both datasets, there was strong agreement that AI use is largely restricted to proprietary or closed systems to reduce legal risk. As Julian stated, ‘No proprietary assets go into public models. That’s a hard rule’. Farah similarly explained, ‘The safest approach is separation. Sensitive data stays out of public models. Proprietary work uses controlled environments’. Here, two related concerns are raised: first, that artists and studios may not know what copyrighted material has informed the outputs of public AI systems; and second, that their own assets, designs, or client materials could be absorbed into training datasets without consent, attribution, or control. These concerns align with research highlighting copyright ambiguity in AI systems, particularly where training data operates as a ‘black box’ and creative work may be used without consent (Oberting, 2024; Pasquale and Sun, 2024). Given the film industry’s reliance on intellectual property (Phillips, 2004), resistance to

such risks reflects broader concerns around authorship and employment (Narayan et al., 2022). These positions are also shaped by practitioners' different forms of professional responsibility. As a studio owner, Julian's caution is likely informed not only by legal uncertainty, but by the need to protect client relationships, maintain trust, and avoid exposing proprietary material to uncontrolled systems. For freelancers such as Farah and Elena, similar caution may operate as a form of professional self-protection within a competitive and contractually constrained industry. Using prohibited or legally ambiguous tools could jeopardise client relationships, studio trust, and future employment, making adherence to studio restrictions an important part of maintaining reputation as well as compliance. That is not to say that participants were rejecting AI outright; practitioners described adapting their workflows to enable limited experimentation while maintaining control. Elena noted, 'I'm focusing on local, open-source tools and controlled inputs... I'm not relying on cloud-based black boxes', indicating a preference for contained systems. Such approaches respond to concerns that creative work could be absorbed into training datasets without attribution (Narayan et al., 2022). Tools such as CopyCat offer partial mitigation by training models on artists' own material, allowing more reliable outputs while addressing issues of 'data provenance' (Cherbetji, 2025). Although these protections do not extend beyond production, controlled environments reduce uncertainty and reinforce the narrow conditions under which AI is currently used. Legal and infrastructural constraints, then, become part of the technology's practical operation, shaping not only whether AI is used, but where, by whom, and with what kinds of material.

Participants also demonstrated strong technical literacy and an ability to critically evaluate AI tools. While not all were integrating GenAI into workflows, many contextualised it through existing practices. Marcus explained, 'The node stuff makes sense to me because it feels a bit like Nuke', while Noor noted that 'If you've come from Flame, you're used to learning tools that abstract complexity. Copycat is just doing that in a different way'. These comparisons suggest that cautious adoption is not due to a lack of skill or understanding. Instead, constraints stem from structural conditions within the VFX industry, including established pipelines, rigid workflows, and contractual frameworks that limit opportunities for experimentation and integration (Curtin and Vanderhoef, 2015; Jones, 2023).

Discussion

This article extends earlier research (Narayan et al., 2022) by moving beyond a focus on industry attitudes to examine how AI and generative AI are encountered, evaluated, and constrained within contemporary VFX production. Earlier findings identified cautious optimism shaped by ethical, legal, and creative concerns. The present study suggests that such ambivalence has not disappeared as the technology has developed, which is not unique to VFX and is apparent in other creative industries. Across creative and cultural industries, uncertainty around GenAI reflects the relative novelty of the technology, the instability of its legal and ethical frameworks, and the difficulty of determining how it will reshape professional practice (see, e.g., Caporusso, 2023; Lim et al., 2025; Matthews et al., 2023; Wei, 2025). What is significant in the VFX context is that this apprehension emerges within a field otherwise characterised by technological fluency and a long-standing openness to computational tools, procedural workflows, and software innovation (Rüling and Duymedjian, 2014; Narayan et al., 2022). Responses to AI therefore sit along a spectrum: some participants saw it as useful for ideation, prototyping, and technical decision-making; others experienced it primarily as a source of uncertainty, speculative upskilling, or additional downstream correction; and some held both views at once, recognising its usefulness while questioning its readiness for professional VFX pipelines. That spectrum is shaped by a gap between some media narratives of AI's transformative potential and the lived realities of VFX labour, where

the usefulness of GenAI depends not only on what the technology can produce, but on whether it can be incorporated into established pipelines, legal frameworks, quality-control expectations, labour practices, and creative decision-making processes.

Across the media coverage and quoted industry commentary analysed here, AI and GenAI are frequently framed as tools for accelerating production, reducing costs, and alleviating labour-intensive work in the VFX industry. Industry leaders, studios, and AI developers position AI as a means of supporting creative production in a sector marked by financial instability and ongoing competition (Curtin and Vanderhoef, 2015; Jones, 2023). Such claims align with scholarship that presents AI as an efficiency-enhancing technology across production workflows (Amankwah-Amoah et al., 2024; Erickson, 2024; Narayan et al., 2022). They also reflect the kinds of inflated expectations that often accompany emerging technologies, where media and industry discourse can amplify anticipated value before practical uses are fully established (Dedehayir and Steinert, 2016; Koh and Doroudi, 2023). Given the precarious conditions of VFX labour, where studios may face bankruptcy and workers encounter unstable employment, it is unsurprising that AI is framed positively and as a potential solution.

Participant accounts suggest that these claims of acceleration, automation, and labour-saving are unevenly realised in everyday VFX practice. For many VFX artists, the automation of repetitive tasks had not meaningfully materialised. Rotoscoping, tracking, and clean-up work continued to dominate daily workflows, even as industry discourse suggested such labour was nearing obsolescence. The tension between public claims and everyday practice produced professional uncertainty that extended beyond job security. Artists were encouraged to upskill in response to AI hype while continuing to perform largely unchanged manual work. Such conditions may generate cognitive dissonance (Festinger, 1962), as practitioners attempt to reconcile established understandings of VFX practice with claims of imminent automation. At the same time, participant ambivalence may also reflect a form of professional boundary work, as artists reaffirm the competencies, judgement, and craft knowledge that distinguish VFX practice from automated image generation. In this sense, caution around GenAI may be shaped both by uncertainty about how the technology will develop and by a desire to protect the creative and technical standards through which VFX labour is valued. Within an industry already shaped by time pressure, constrained budgets, and expectations to continually ‘do more with less’ (Christopherson, 2009), demands to maintain output while investing in speculative skills may intensify stress, diminish creative engagement, and lead some to reconsider long-term careers in VFX (Gotsi et al., 2010; Hesmondhalgh and Baker, 2008; Rowlands and Handy, 2012).

Admittedly, creative labour has long been characterised by uncertainty and risk (Caves, 2003). GenAI introduces an additional layer of epistemic instability, as practitioners struggle to determine whether engagement with emerging tools represents professional foresight or a misallocation of time and energy. Such uncertainty appeared most acute among early-career artists, whose position in the industry may be perceived as less secure when their daily work often remains tied to the kinds of labour that AI is publicly imagined to reduce or replace. Conflicting claims about AI’s capabilities, particularly when contrasted with its limitations in practice, risk eroding confidence among those still establishing themselves within VFX and less habituated to the longer-term precarity of creative labour. By contrast, the leading voices in media coverage and a couple of the more senior participants did frame AI in terms of potential incorporation into production pipelines, even where they remained cautious about its limits. Perhaps for those with greater authority or experience, AI could be imagined as a tool for experimentation, evaluation, or workflow support; for newer entrants, it more often appeared as an ambiguous signal about the future value of the very tasks through which they were learning the industry. These tensions may also deter new entrants to

the field as the industry continues to negotiate what AI can realistically achieve within production environments shaped by rigid workflows, contractual obligations, and legal constraints (Curtin and Vanderhoef, 2015).

Apprehension around GenAI uptake should not be understood as technological illiteracy or resistance to innovation. Consistent with earlier findings (Narayan et al., 2022), participants demonstrated strong fluency in computational workflows and situated AI within familiar paradigms of abstraction, procedural logic, and node-based systems. Participants, like many of the industry figures represented in media coverage, recognised the potential value of AI within particular stages of production. Their caution centred on the distance between this anticipated value and the current capacities of generative systems, especially where professional image-making requires realism, verisimilitude, continuity, and fine-grained control within specific genres, screen worlds, and production contexts (Dinur, 2023; Giralt, 2017; Rüling and Duymedjian, 2014). In this sense, the gap between hype and practice is a socio-technical problem of integration. GenAI may produce compelling images or accelerate early ideation, but participants' accounts suggest that current systems do not always allow artists to steer, revise, and account for outputs in the ways professional VFX work requires. This echoes human-centred approaches to AI, which argue that automation is most useful when it extends human expertise while preserving meaningful control and responsibility (Shneiderman, 2020). As GenAI tools develop, these conditions may shift; at present, however, participants' apprehension appears tied to a mismatch between the technology's current capabilities and the professional, aesthetic, and structural demands of VFX production.

The findings also complicate claims that GenAI will deliver efficiencies through the displacement of creative labour. While both media coverage and interviewees acknowledged that AI could save time and resources in specific contexts, such efficiencies are largely confined to early-stage experimentation, rapid visualisation, and high-level decision-making. In practice, GenAI was described as useful for testing possibilities, evaluating visual directions, and discarding unviable ideas before committing additional labour. Such patterns align with scholarship positioning GenAI as augmentative rather than substitutive (Bender, 2025; Erickson, 2024; Pearson, 2022; Pedota et al., 2025), while also echoing human-centred approaches to AI that understand automation as most valuable when it extends human expertise and supports user control rather than replacing human judgement (Shneiderman, 2020). In the VFX context, artists remain central to assessing whether AI-generated material is usable, appropriate, and compatible with the wider production pipeline, reinforcing arguments that creative professionals increasingly act as curators and evaluators of AI-generated outputs (Atkinson and Baker, 2023; Demsar et al., 2025). Yet AI does not simply reduce labour. Where outputs lack sufficient control, consistency, or production-readiness, work is often redistributed downstream as artists validate, correct, or rebuild material to meet professional standards. GenAI's current value in VFX, therefore, appears less as an autonomous creative substitution than as a provisional form of human-machine coordination, whose usefulness depends on artists' capacity to interpret, constrain, and rework outputs within existing production systems.

Environmental sustainability also emerged as a significant concern. While earlier research on AI in film focused on authorship, copyright, and employment (Obretting, 2024; Pasquale and Sun, 2024), both media coverage and practitioner perspectives increasingly address the ecological implications of GenAI. Concerns about energy consumption, water use, and carbon emissions position AI within wider debates about sustainable production (Chauhan et al., 2024; van Wynsberghe, 2021; Yu et al., 2024). At the same time, some participants suggested that AI could reduce environmental impact by optimising resource-intensive workflows. Such perspectives highlight ongoing tensions within sustainability discourse and the importance of scale when evaluating technological impact.

A key finding is that widespread discussion of AI within the film industry does not, in itself, signal stable or uniform adoption. Both media coverage and interviews indicate that AI will play an increasing role in the future of VFX, but current applications remain tightly conditioned by the contexts in which they are used. Concerns around copyright, intellectual property, data provenance, and contractual liability shape how AI is deployed, leading studios to favour closed or locally trained systems over public models. Although some promotional, executive, and trade press accounts present AI as a disruptive force, current VFX practice appears to absorb it selectively, particularly where it can be reconciled with existing standards of ownership, accountability, continuity, and pipeline control. This gap between visibility and practical adoption can be understood through hype dynamics, though not as evidence of a fixed or predictable cycle. At present, GenAI in VFX appears to sit between heightened claims about future transformation and more cautious assessments of what the technology can presently support in production (Dedehayir and Steinert, 2016; Koh and Doroudi, 2023). Moving from expectation to embedded practice, therefore, requires more than technological improvement. As production studies scholarship has long emphasised, technological change is also shaped by legal, economic, and institutional conditions (Hesmondhalgh and Baker, 2010).

Recent industry developments illustrate how the conditions of AI use in film and VFX are still being worked out. Challenges encountered in AI-generated productions, legal action against companies such as Midjourney (FP Tech Desk, 2025), and collaborations aimed at shaping AI's role in filmmaking (Weprin, 2025) all point to unresolved questions about how AI can be made usable, accountable, and commercially viable. These questions are especially pronounced in film production, which operates within rigid pipelines (Seidel et al., 2010), high financial stakes (Curtin and Vanderhoef, 2015), and tightly protected intellectual property (McCalman, 2004). Unlike other creative sectors where experimentation may involve lower risks (Matthews et al., 2023; Tsao et al., 2025), VFX work requires outputs that can be revised, owned, approved, and integrated into collaborative production systems. If GenAI systems become more adjustable, legally secure, and compatible with established VFX workflows, the balance may shift toward wider adoption, particularly given the importance of pipeline integration, intellectual property protection, and client accountability in film production. In terms of hype dynamics, such a shift would involve movement from heightened expectation and early disappointment toward more clearly demonstrated uses, where practical benefits become repeatable enough to be incorporated into production routines (Dedehayir and Steinert, 2016; Koh and Doroudi, 2023). It would also depend on human-centred design principles, where automation enhances performance while preserving artists' capacity to direct, revise, and remain accountable for creative work (Shneiderman, 2020).

While the interview data reflects diverse roles and experience levels, the sample remains limited in scale and geography and should not be treated as representative of the global VFX industry. The findings, therefore, capture a particular moment in the development of GenAI, rather than a settled account of its long-term consequences. Future research could compare AI adoption across national contexts, production scales, and labour conditions, particularly as tools become more technically mature and as legal frameworks around training data, copyright, and ownership develop. The study also prioritises qualitative insights and does not measure productivity, cost, or environmental impact. Further work could incorporate empirical data such as budgets, time use, and energy consumption. In addition, perspectives from directors, producers, legal teams, and audiences remain underexplored, particularly given the importance of copyright and risk. The uneven distribution of AI's benefits, which favour senior roles, warrants a longitudinal study of early-career pathways. Finally, environmental concerns highlight the need for interdisciplinary research examining AI's sustainability implications across production systems. Such research would be able to assess

whether current apprehension gives way to more established forms of human-machine coordination, or whether the structural, aesthetic, and legal constraints identified here continue to limit GenAI's role in professional VFX practice.

Conclusion

This study builds on earlier research about AI in VFX (Narayan et al., 2022) by showing that GenAI's significance lies less in straightforward labour replacement than in the uneven ways it is being interpreted, tested, and constrained within professional production systems. Across media discourse and participant accounts, AI emerged as a technology surrounded by heightened expectations, but its current value in VFX remains tied to specific uses such as ideation, rapid visualisation, evaluation, and decision support. Participants recognised the potential of these tools, yet their apprehension reflected ongoing uncertainty about whether GenAI can meet the technical, aesthetic, legal, and procedural demands of professional VFX work. Current constraints should not be treated as evidence that AI will not reshape the industry; instead, they capture a transitional moment in which adoption is being negotiated through pipeline compatibility, human control, intellectual property concerns, quality standards, and differences between promotional narratives and practitioner experience. GenAI's future in VFX is therefore unlikely to be defined by simple replacement or refusal, but by the conditions under which it becomes accountable, useful, and compatible with a highly structured creative industry.

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ORCID iDs

AD Narayan  <https://orcid.org/0009-0000-1124-8106>

Angelique Nairn  <https://orcid.org/0000-0001-5609-2627>

Justin Matthews  <https://orcid.org/0000-0003-3508-6564>

Ethical considerations

Ethics was approved by the Auckland University of Technology Ethics Committee (AUTEC). The approval number is (24/29) and was granted on 19 March 2024.

Consent to participate

All participants gave informed consent. Participation was voluntary, and the participants had two weeks to consider the invitation to take part in the study. Upon agreeing to take part, written consent was required, including completing and signing a consent form. No interviewees participated until the consent forms were signed. As per AUT ethics policies, participants were advised that they could refuse to answer questions or withdraw from the study at any time.

Consent for publication

On completing and signing the consent form, participants agreed (in writing) to their data being used in publishable manuscripts. As part of the agreement, all confidential material was removed and to protect anonymity, pseudonyms were used.

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Data availability statement

The participants of this study did not give written consent for their raw data to be shared publicly, so due to the sensitive nature of the research, supporting interview data is not available. The news media articles that were analysed are included in the reference list.

Notes

1. The 26 articles (Cherbetji, 2025; Cho, 2025; Diaz, 2025; Ford, 2025; FX Guide, 2025; Giardina, 2025a, 2025b, 2025c, 2025d; Goodfellow, 2025; Hayes, 2025; Hogg, 2025; Jones and O'Falt, 2025; Marc, 2025; McCullaugh, 2025; Mottram, 2025; N  nez, 2025; Opentools, 2025; PC Mag, 2025; Perkel, 2025; Pulliam-Moore, 2025; Szalai, 2025a, 2025b; Seymour, 2025; Vlessing, 2025; Welk, 2025).
2. For context: A technical blocker refers to a decision point where technical uncertainty stalls a shot before meaningful work can begin. For example, a supervisor noticing that distant buildings in an Unreal Engine render appear soft and lacking in detail faces a problem with several possible causes: insufficient Nanite falloff settings, temporal anti-aliasing ghosting on fine geometry, low-resolution virtual shadow maps at range, or simply the renderer treating distant geometry as low-priority LOD. Without AI support, diagnosing which of these is the culprit might mean pulling a senior technical artist off another task to run a series of tests. With it, the supervisor can work through a rapid diagnostic conversation, ruling out causes systematically and arriving at a prioritised list of fixes to test. Where the problem proves difficult to resolve purely within the pipeline, an AI model can also help think through hybrid solutions. In this case, integrating 2.5D photographic cards of real buildings behind the Unreal geometry offered a practical workaround. Because the Unreal pipeline in question had limited pass output, with no deep EXR or separate environment mattes available, the conversation focused on what was actually achievable: using the available beauty pass and any alpha or depth information to seat the cards convincingly, and identifying where edge blending between the CG foreground and the 2.5D background would need to be handled in comp rather than at the render stage. This kind of constrained problem-solving, working within a fixed pipeline rather than assuming ideal conditions, is where AI support proved particularly useful.

References

- Adams WC (2015) Conducting semi-structured interviews. In: in Newcomer KE, Hatry HP and Wholey JS (eds) *Handbook of Practical Program Evaluation* (4th edn). Jossey-Bass, 492–505. <https://doi.org/10.1002/9781119171386.ch19>
- Amankwah-Amoah J, Abdalla S, Mogaji E, et al. (2024) The impending disruption of creative industries by generative AI: Opportunities, challenges, and research agenda. *International Journal of Information Management* 75: 102759. .
- Anantrasirichai N and Bull D (2022) Artificial intelligence in the creative industries: A review. *Artificial Intelligence Review* 55: 589–656.
- Appelbaum SH (1997) Socio-technical systems theory: An intervention strategy for organizational development. *Management Decision* 35(6): 452–463.

- Atkinson P and Barker R (2023) AI And the social construction of creativity. *Convergence: The International Journal of Research into New Media Technologies* 29(4): 1054–1069.
- Barber N (2024) New Tom Hanks film *Here* and the unsettling “de-aging” technology keeping stars forever young. *BBC Culture*, 2 July. Available at: <https://www.bbc.com/culture/article/20240701-new-tom-hanks-film-here-and-the-unsettling-new-de-aging-technology-keeping-stars-forever-young>
- Bender S (2025) Generative AI, the media industries, and the disappearance of human creative labour. *Media Practice and Education* 26(2): 200–217. .
- Bhattacharya S (2023) Hollywood protest against artificial intelligence application in creative work. *International Journal of Research in Engineering, Science and Management* 6(10): 62–64.
- Braun V and Clarke V (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology* 3(2): 77–101. .
- Braun V and Clarke V (2013) *Successful Qualitative Research: A Practical Guide for Beginners*. Sage.
- Braun V, Clarke V, Hayfield N, et al. (2023) Doing reflexive thematic analysis. In: *Supporting Research in Counselling and Psychotherapy: Qualitative, Quantitative, and Mixed Methods Research*. Springer, 19–38.
- Brown K (2021) The marvels of AI change the face of film. *The University of Adelaide Newsroom*. 21 October. Available at: <https://www.adelaide.edu.au/newsroom/news/list/2021/10/22/the-marvels-of-ai-change-the-face-of-film>
- Byrne D (2022) A worked example of Braun and Clarke’s approach to reflexive thematic analysis. *Quality & Quantity* 56: 1391–1412. .
- Caporusso N (2023) Generative artificial intelligence and the emergence of creative displacement anxiety. *Research in Psychology and Behavior* 3(1): 1–12.
- Caves RE (2003) *Creative Industries: Contracts between Art and Commerce*. Harvard University Press.
- Chauhan D, Bahad P and Jain JK (2024) Sustainable AI environmental implications, challenges, and opportunities. In: Tiwari RS, Dhanaraj RK and Kadry S (eds) *Explainable AI (XAI) for Sustainable Development: Trends and Applications*. CRC Press, 1–15.
- Cherbetji A (2025) The untapped potential of ML in VFX. *Animation World Network*, 7 April. Available at: <https://www.awn.com/vfxworld/untapped-potential-ml-vfx>
- Cho W (2024) The Hollywood jobs most at risk from AI. *The Hollywood Reporter*, 30 January. Available at: <https://www.hollywoodreporter.com/business/business-news/ai-hollywood-workers-job-cuts-1235811009/>
- Cho W (2025) OpenAI is ready for Hollywood to accept its vision. *The Hollywood Reporter*, 25 March. Available at: <https://www.hollywoodreporter.com/business/business-news/openai-hollywood-sora-1236170402/>
- Chow PS (2020) Ghost in the (Hollywood) machine: Emergent applications of artificial intelligence in the film industry. *European Journal of Media Studies* 9(1): 193–214.
- Chow PS and Celis Bueno C (2025) The cloak of creativity: AI imaginaries and creative labour in media production. *European Journal of Cultural Studies*: 1–10. <https://doi.org/10.1177/13675494251322991>
- Christopherson S (2009) Working in the creative economy: Risk, adaptation, and the persistence of exclusionary networks. In: McKinlay A and Smith C (eds) *Creative Labour: Working in the Creative Industries*. Bloomsbury, 72–90.
- Curtin M and Vanderhoef J (2015) A vanishing piece of the Pi: The globalization of visual effects labor. *Television & New Media* 16(3): 219–239. .
- Cusic D, Faulk GK and Lambert RP (2005) Technology and music piracy: Has the recording industry lost sales? *Studies in Popular Culture* 28(1): 15–24.
- Dahlberg H, Adler D and Newlin J (2019) Machine-learning denoising in feature film production. In: SIGGRAPH 2019 Conference, Los Angeles, 28 July–1 August. Available at: <https://history.siggraph.org/learning/machine-learning-denoising-in-feature-film-production-by-dahlberg-adler-and-newlin/>

- Dedehayir O and Steinert M (2016) The hype cycle model: A review and future directions. *Technological Forecasting and Social Change* 108: 28–41.
- Demsar V, Ferraro C, Sands S, et al. (2025) Harmony or discord? *Journal of Advertising Research* 65(2): 150–166. .
- Diaz J (2025) ILM is embracing AI like any other tool, and you should too. *Fast Company*, 20 May. Available at: <https://www.fastcompany.com/91337363/ilm-is-embracing-ai-like-any-other-tool-and-you-should-too>
- Dinur E (2023) *The Filmmaker's Guide to Visual Effects: The Art and Techniques of VFX for Directors, Producers, Editors and Cinematographers*. Routledge.
- Erickson K (2024) AI and work in the creative industries: Digital continuity or discontinuity? *Creative Industries Journal*: 1–21. <https://doi.org/10.1080/17510694.2024.2421135>
- Essien EO, Kalkat A and Lamichhane S (2025) Human artistry in an AI-driven film industry: Evaluating the role of creativity in Hollywood VFX. *The Journal of Communication and Media Studies* 10(1): 63–82.
- Festinger L (1962) Cognitive dissonance. *Scientific American* 207(4): 93–106.
- Ford L (2025) How Clear Angle Studios is harnessing the power of Hollywood's most sought-after VFX tech. *The Hollywood Reporter*, 16 June. Available at: <https://www.hollywoodreporter.com/movies/movie-features/clear-angle-studios-pinewood-3d-scanning-andor-technology-1236291635/>
- FP Tech Desk (2025) Major movie studios join fight against AI as Disney, Universal sue image-generator Midjourney. *Firstpost*, 11 June. Available at: <https://www.firstpost.com/tech/disney-universal-lawsuit-midjourney-ai-image-generator-copyright-infringement-ws-d-13896321.html>
- FXguide (2025) Oscar-winning legend Rob Legato on Stability AI & the future of VFX. 20 March. Available at: <https://www.fxguide.com/fxpodcasts/fxpodcast-we-talk-to-oscar-winning-legend-rob-legato-about-stability-ai-the-future-of-vfx/>
- Garcia MB (2024) The paradox of artificial creativity. *Creativity Research Journal* 37(4): 755–768. .
- Giardina C (2025a) Godzilla minus one director Takashi Yamazaki; Here VFX pros weigh in on AI at VES Awards. *Variety*, 12 February. Available at: <https://variety.com/2025/artisans/news/godzilla-minus-one-director-takashi-yamazaki-ai-ves-awards-1236305429/>
- Giardina C (2025b) Behind the “sickening” collapse of Technicolor and why its failure is sending shockwaves through the VFX industry. *Variety*, 4 March. Available at: <https://variety.com/2025/artisans/global/technicolor-collapse-shockwaves-vfx-1236326607/>
- Giardina C (2025c) VFX studio Cinesite launches gen AI research unit (exclusive). *Variety*, 15 May. Available at: <https://variety.com/2025/artisans/global/cinesite-gen-ai-research-techx-vfx-1236399519/>
- Giardina C (2025d) Could AI help the Emmys? Why the TV community is “curious, but not yet committed”. *Variety*, 3 June. Available at: <https://variety.com/2025/tv/awards/ai-emmys-not-yet-committed-1236416886/>
- Giralt GF (2017) The interchangeability of VFX and live action and its implications for realism. *Journal of Film and Video* 69(1): 3–17.
- Goodfellow M (2025) Animation, writers & actors guilds hold “historic” anti-generative AI protest at Annecy: “GenAI seeks not to support artists, but to destroy them”. *Deadline*, 12 June. Available at: <https://deadline.com/2025/06/annecy-ai-protest-animation-guilds-1236431752/>
- Gotsi M, Andriopoulos C, Lewis MW, et al. (2010) Managing creatives: Paradoxical approaches to identity regulation. *Human Relations* 63(6): 781–805. .
- Hayes D (2025) Ted Sarandos responds to James Cameron's vision of AI making movies cheaper: “There's an even bigger opportunity to make movies 10% better”. *Deadline*, 17 April. Available at: <https://deadline.com/2025/04/ted-sarandos-netflix-james-cameron-ai-movies-better-cheaper-1236371326/>
- Hesmondhalgh D and Baker S (2008) Creative work and emotional labour in the television industry. *Theory, Culture & Society* 25(7–8): 97–118.
- Hesmondhalgh D and Baker S (2010) A very complicated version of freedom: Conditions and experiences of creative labour in three cultural industries. *Poetics* 38: 4–20. .

- Hogg T (2025) Wonder Dynamics helps Boxel Studio embrace machine learning and AI. *Animation World Network*, 28 February. Available at: <https://www.awn.com/vfxworld/wonder-dynamics-helps-boxel-studio-embrace-machine-learning-and-ai>
- Holton R and Boyd R (2021) Where are the people? What are they doing? Why are they doing it? (Mindell) Situating artificial intelligence within a socio-technical framework. *Journal of Sociology* 57(2): 179–195.
- Janiesch C, Zschech P and Heinrich K (2021) Machine learning and deep learning. *Electronic Markets* 31: 685–695.
- Jones M and O’Falt C (2025) “A complete unknown” used AI? Your iPhone photos use more AI than any 2025 Oscar nominee. *IndieWire*, 7 February. Available at: <https://www.indiewire.com/news/analysis/oscars-consider-ai-disclosure-a-complete-unknown-1235093013/>
- Jones N (2023) Far from Houdini: The “magic” of the VFX breakdown. *Animation* 18(1): 42–58.
- Kleiman Y, Pabst S and Nagle P (2019) Boosting VFX production with deep learning. SIGGRAPH 2019 Conference, Los Angeles, 28 July–1 August. <https://dl.acm.org/doi/abs/10.1145/3306307.3328208>
- Koh E and Doroudi S (2023) Learning, teaching, and assessment with generative artificial intelligence: Towards a plateau of productivity. *Learning: Research and Practice* 9(2): 109–116.
- Lee D, Li A and Lin K (2025) AI-powered real-time VFX for mobile. In: Proceedings of the Special Interest Group on Computer Graphics and Interactive Techniques Conference Talks. <https://doi.org/10.1145/3721239.3734099>
- Lee H-K (2022) Rethinking creativity: Creative industries, AI and everyday creativity. *Media, Culture & Society* 44(3): 601–612. .
- Leffler R (2025) “It’s the wild west,” says James Cameron of the use of generative AI in film. *Screen Daily*, 12 August. Available at: <https://www.screendaily.com/news/its-the-wild-west-says-james-cameron-of-the-use-of-generative-ai-in-film/5207732.article>
- Lim RE, Kim S, Abernathy A, et al. (2025) Excited or anxious about adopting generative AI? Investigating the drivers of generative AI adoption among advertising creatives. *Journal of Marketing Communications*: 1–24.
- Liu X, Zeng A, Xue W, et al. (2025) VFX creator: Animated visual effect generation with controllable diffusion transformer. *arXiv preprint*. <https://arxiv.org/abs/2502.05979>
- Makarius EE, Mukherjee D, Fox JD, et al. (2020) Rising with the machines: A sociotechnical framework for bringing artificial intelligence into the organization. *Journal of Business Research* 120: 262–273.
- Marc C (2025) James Cameron believes A.I. could cut VFX-heavy blockbuster budgets in half without sacrificing jobs. *The Playlist*, 15 April. Available at: <https://theplaylist.net/james-cameron-talks-vfx-avatar-dune-20250415/>
- Matthews J, Fastnedge D and Nairn A (2023) The future of advertising campaigns: The role of AI-generated images in advertising creative. *Journal of Pervasive Media* 8(1): 29–49.
- Matthews J, Nairn A, Fastnedge D, et al. (2026) Creative expertise and generative AI in visual design practice. *The International Journal of Creative Media Research* 13(1): 1–28.
- McCalman P (2004) Foreign direct investment and intellectual property rights: Evidence from Hollywood’s global distribution of movies and videos. *Journal of International Economics* 62(1): 107–123.
- McCullaugh J (2025) AI/VFX roundtable: Revolutionizing imagery – The future of AI and newer tech in VFX. *VFX Voice*, 1 July. Available at: <https://vfxvoice.com/ai-vfx-roundtable-revolutionizing-imagery-the-future-of-ai-and-newer-tech-in-vfx/>
- Morris R (2025) AI was enemy No. 1 during Hollywood strikes. Now it’s in Oscar-winning films. *BBC News*, 31 March. Available at: <https://www.bbc.com/news/articles/ce303x19dwgo>
- Mottram J (2025) “I do the best I can”: Robert Zemeckis breaks down criticism of new AI-heavy Tom Hanks film. *The Independent*, 12 January. Available at: <https://www.independent.co.uk/arts-entertainment/films/features/robert-zemeckis-interview-here-tom-hanks-b2676485.html>

- Narayan A D, Caillard D, Matthews J, et al. (2022) Artificial imagination: Industry attitudes on the impact of AI on the visual effects process. *Interactions: Studies in Communication & Culture* 13(2): 113–131.
- Núñez M (2025) Smoke, reflections and portals: Adobe's TransPixar takes AI VFX to the next level. *VentureBeat*, 8 January. Available at: <https://venturebeat.com/ai/smoke-reflections-and-portals-adobes-transpixar-takes-ai-vfx-to-the-next-level>
- Oberting VA IV (2024) Generative artificial intelligence and copyright in the film and media industry. *Washington and Lee Law Review Online* 82: 123–171.
- Opentools (2025) Version Zero AI's innovative spline-based rotoscoping: A game-changer for VFX', 21 May. Available at: <https://opentools.ai/news/version-zero-ais-innovative-spline-based-rotoscoping-a-game-changer-for-vfx>
- Parker R and Cox S (2013) Power relations and small and medium-sized enterprise strategies for capturing value in global production networks: Visual effects (VFX) service firms in the Hollywood film industry. *Regional Studies* 47(7): 1095–1110.
- Pasquale F and Sun H (2024) Consent and compensation: Resolving generative AI's copyright crisis. *Virginia Law Review Online* 110: 207–247.
- PCMag (2025) Director James Cameron is open to using AI to reduce filmmaking costs. *Yahoo Tech*, 11 April. Available at: <https://tech.yahoo.com/articles/director-james-cameron-open-using-164551792.html>
- Pearson A (2022) The rise of creAltives: Using AI to enable and speed up the creative process. *Journal of AI, Robotics & Workplace Automation* 2(2): 1–14.
- Pedota M, Cicala F and Basti A (2025) Human agents, generative AI, and innovation: A formal model of hybrid creative process. *Technovation* 148: 103323.
- Perkel S (2025) Netflix chief says the “bigger opportunity” for AI in filmmaking isn't just cutting costs, but making movies “10% better”. *Business Insider*, 19 April. Available at: <https://www.businessinsider.com/netflix-ted-sarandos-james-cameron-ai-makes-movies-better-cheaper-2025-4>
- Peterson RA (1982) Five constraints on the production of culture: Law, technology, market, organizational structure and occupational careers. *Journal of Popular Culture* 16(2): 143.
- Phillips R (2004) The global export of risk: Finance and the film business. *Competition & Change* 8(2): 105–136.
- Pulliam-Moore C (2025) Hollywood's pivot to AI video has a prompting problem. *The Verge*, 30 June. Available at: <https://www.theverge.com/ai-artificial-intelligence/694687/asteria-bryn-mooser-uncanny-valley-gen-ai>
- Pulver A (2025) Emily Blunt and SAG-AFTRA join film industry condemnation of “AI actor” Tilly Norwood. *The Guardian*, 30 September. Available at: <https://www.theguardian.com/film/2025/sep/30/emily-blunt-sag-aftra-film-industry-condemnation-ai-actor-tilly-norwood>
- Rowlands L and Handy J (2012) An addictive environment: New Zealand film production workers' subjective experiences of project-based labour. *Human Relations* 65(5): 657–680.
- Rüling CC and Duymedjian R (2014) Digital bricolage: Resources and coordination in the production of digital visual effects. *Technological Forecasting and Social Change* 8: 98–110.
- Sartori L and Theodorou A (2022) A sociotechnical perspective for the future of AI: Narratives, inequalities, and human control. *Ethics and Information Technology* 24(1): 1–11.
- Seidel S, Shortland K, Court D, et al. (2010) Managing creativity-intensive processes: Learning from film and visual effects production. In: vom Brocke J and Rosemann M (eds) *Handbook on Business Process Management* 2. Springer. https://doi.org/10.1007/978-3-642-01982-1_24
- Seymour M (2025) How generative AI is being used in VFX (VES panel). *fxguide*, 20 February. Available at: <https://www.fxguide.com/quicktakes/how-gen-ai-is-being-used-in-vfx-right-now-ves-panel/>
- Shneiderman B (2020) Human-centered artificial intelligence: Reliable, safe & trustworthy. *International Journal of Human–Computer Interaction* 36(6): 495–504.
- Singh H, Rastogi A and Kaur K (2023) Artificial intelligence as a tool in the visual effects and film industry. In: *Recent Advances in Computing Sciences*. CRC Press, 312–316.

- Szalai G (2025a) BFI report sets out nine recommendations to ensure “ethical, sustainable, inclusive AI” use. *The Hollywood Reporter*, 8 June. Available at: <https://www.hollywoodreporter.com/business/business-news/bfi-ai-recommendations-report-1236257633/>
- Szalai G (2025b) Everything everywhere all at once effects guru talks pretend VFX and the coming AI “tsunami”. *The Hollywood Reporter*, 13 March. Available at: <https://www.hollywoodreporter.com/movies/movie-news/everything-everywhere-all-at-once-jeff-desom-ai-pretend-vfx-1236162610/>
- Tamasco M (2026) Ben Affleck downplays AI fear in film industry, says “laws already exist” to protect artists’ likeness. *Yahoo Entertainment*, 17 January. Available at: <https://www.yahoo.com/entertainment/movies/articles/ben-affleck-downplays-ai-fears-172936282.html>
- Tang J, Kim K and Wang K (2024) From screen to reality: Exploring the evolution and integration of motion capture technology for virtual digital humans. *Asia-Pacific Journal of Convergent Research Interchange* 10: 153–168.
- Tsao J, Liang CX, Nogues C, et al. (2025) Perceptions and integration of generative artificial intelligence in creative practices and industries: A scoping review and conceptual model. *AI & Society*: 1–20. <https://doi.org/10.1007/s00146-025-02667-2>.
- van Wynsberghe A (2021) Sustainable AI: AI for sustainability and the sustainability of AI. *AI and Ethics* 1: 213–218.
- Venkatasawmy R (2012) The evolution of VFX-intensive filmmaking in the 20th century Hollywood cinema: An historical overview. *TMC Academic Journal* 6(2): 17–31.
- Verma AK and Haider F (2024) ‘Revolutionizing realities: The impact of artificial intelligence in visual effects’. *Media and AI: Navigating*: 7.
- Vlessing E (2025) Dune VFX house DNEG makes major move into AI, unveils deal to buy Metaphysic. *Yahoo Finance*, 19 February. Available at: <https://finance.yahoo.com/news/dune-vfx-house-dneg-makes-160000234.html>
- Wei LW (2025) “I am creative, therefore I am employable”: Self-creativity identity as a mediator of the AI-unemployment anxiety link. *Beijing International Review of Education* 7(3): 224–238.
- Welk B (2025) Benjamin Button VFX pioneer Ed Ulbrich on why he joined “ethical” AI company Moonvalley: “There’s something here”. *Yahoo News*, 25 June. Available at: <https://ca.news.yahoo.com/benjamin-button-vfx-pioneer-ed-130000437.html>
- Weprin A (2025) Darren Aronofsky launches AI-driven storytelling venture, as Google unveils new gen AI video tool. *The Hollywood Reporter*, 20 May. Available at: <https://www.hollywoodreporter.com/business/digital/darren-aronofsky-google-ai-studio-veo-3-flow-tool-1236222363/>
- Willis JW, Jost M and Nilakanta R (2007) *Foundations of Qualitative Research: Interpretive and Critical Approaches*. Sage.
- Yamazaki A (2024) Digital replicas and democracy: Issues raised by the Hollywood actor’s strike. *Humanities & Social Sciences Communications* 11(1): 1661. Advance online publication.
- Yang A (2025) For some in the industry, AI filmmaking is already becoming mainstream. *NBC News*, 17 June. Available at: <https://www.nbcnews.com/tech/tech-news/industry-ai-filmmaking-already-becoming-mainstream-rcna213066>
- Yu Y, Wang J, Liu Y, et al. (2024) Revisit the environmental impact of artificial intelligence: The overlooked carbon emission source? *Frontiers of Environmental Science & Engineering* 18(12): 158.
- Yuan P, Han MH and Yun TS (2015) The long-term development strategy to enhance the international competitiveness of regional visual effects cluster. *International Journal of Multimedia and Ubiquitous Engineering* 10(4): 113–122. .