Layered encounters: mainstream cinema and the disaggregate digital composite

Layered Encounters: Mainstream Cinema and the Disaggregate Digital Composite

Lisa Purse, University of Reading
(l.v.purse@reading.ac.uk)

Abstract:
The digital surface in cinema has, throughout its relatively brief history, been subject to a familiar "iconophobic" tendency, documented by Rosalind Galt (2011), to denigrate surface decoration as "empty spectacle" (p. 2). In early scholarship on computer generated (CG) images in cinema, the digital surface's alleged seamlessness and "new depthlessness" frequently became an overdetermined nexus of loss: of material presence, of an indexical relation to the world and lived experience, and of the continuation of older traditions of narrative cinema. Today, digital visual effects sequences in mainstream cinema continue to be framed by film reviewers in negative terms: as variously lacking imagination, realism, narrative depth, and affective power. Digital visual effects and digital media scholarship have done much to reclaim the cultural significance of mainstream digital visual effects sequences and their capacity to speak to a rapidly evolving and increasingly encompassing digital media ecology. Yet the formal heterogeneity of this evolving period of mainstream aesthetic consolidation and experimentation with digital images, surfaces and spaces has yet to be fully acknowledged. This article seeks to contribute to this broader task by focussing on the mainstream cinematic history of the digital composite, and specifically those moments where it displays a particularly self-reflexive character. If the digital composite has traditionally been characterised by its attempt to totally erase signs of its composite nature, across the period of CG images' proliferation in cinema an occasional figure emerges that seeks to do the opposite: a digital composite that formally fragments, foregrounds, and scrutinises the digital surfaces that constitute it. Drawing on scholarship on the computer image, digital media and the

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post-cinematic, this article will argue that these returns of the self-conscious digital composite speak meaningfully to their historical context.

Keywords: Digital composite; seamlessness; fragmentation; CGI

The digital surface in cinema has, throughout its relatively brief history, been subject to a familiar "iconophobic" tendency to denigrate surface decoration as "empty spectacle" (Galt, 2011, p. 2). In early scholarship on computer generated (CG) images in cinema, the digital surface's alleged seamlessness and "new depthlessness" (Sobchack, 1994, p. 123n and Landon, 1992, p.66; in Pierson, 1999, p.167) frequently became an overdetermined nexus of loss: of material presence, of an indexical relation to the world and lived experience, and of the continuation of older traditions of narrative cinema. Today, digital visual effects sequences in mainstream cinema continue to be framed by film reviewers in negative terms: as variously lacking imagination, realism, narrative depth, and affective power. Digital visual effects and digital media scholarship have done much to reclaim the cultural significance of mainstream digital visual effects sequences and their capacity to speak to a rapidly evolving and increasingly encompassing digital media ecology. Yet the formal heterogeneity of this period of mainstream aesthetic consolidation and experimentation with digital images, surfaces and spaces has yet to be fully acknowledged. This article seeks to contribute to this broader task by focussing on the mainstream cinematic history of the digital composite, and specifically those moments where it displays a particularly self-reflexive character. If the digital composite has traditionally been characterised by its attempt to totally erase signs of its composite nature, across the period of CG images' proliferation in cinema an occasional figure emerges that seeks to do the opposite: a digital composite that formally fragments, foregrounds, and scrutinises the digital surfaces that constitute it. Drawing on scholarship on the computer image, digital media and the post-cinematic, this article will argue that these returns of the self-conscious digital composite speak meaningfully to their historical context.[1]

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Seamlessness

As Stephen Prince (2012) reminds us, cinema has always been composite, blending together "discrete elements that collectively simulate the representational space of a depicted world" (p. 80). In mainstream narrative cinema, such blending has predominantly focused on creating an image synthesis that is sufficiently integrated to produce the impression of a spatiotemporally cohesive diegetic event, or what Murray Pomerance (2013) calls a "reality" that "seems full and apt and believable in its context as we attend to it" (p. 15). Digital compositing continues this project, but is distinguished from its predecessor by its capacity to erase edge bleed and other indicators of co-presence at pixel level, so that it is often literally impossible to "see the seams" between image elements.[2] In the late 1990s and early 2000s in particular, normative digital compositing practice worked to elide the composite nature of the image under a principle of seamless photorealism, asking the question, "If x existed in our world (an alien spacecraft, a Gollum, a fairy-tale castle) and were photographed, how would it look, and how would it move?" (Turnock, 2012, p. 160; see also Brinkmann, 2008, p. 2). D. N. Rodowick (2007) notes that this "predominant aesthetic […] stresses smoothness, continuity, and seamless boundaries between combined elements," including "the *invisibility of layers* (and thus the apparent uniformity of space, or space defined as the seeming unity of all its contents or elements)" (p. 170). The co-presence of multiple digital surfaces within the digital composite image is thus elided, the "seams" between the profilmic and the digital are no longer situated for us, and all is "the same photorealistic wallpaper," to use Michele Pierson's suggestive phrase (2002, p.153).

The digital image's now-longstanding cultural reputation for surface emptiness and "depthlessness" is founded upon this tradition of seamless compositing and its provision of an undifferentiated digital surface. However, this reputation derives much of its force from the aesthetic design of digital surfaces at a particular historical moment: the early period of computer generated images' integration into film narratives. During the late 1970s and 1980s, as Pierson (2002) has shown, a "hyperreal electronic aesthetic" (p. 87) emerged that sought to echo and enhance those textures that were familiar to audiences in their

2. Optical compositing reached heights of sophistication that also made it impossible at times to "see the seams", but digital imaging tools allow for this to occur on a more regular basis.

everyday encounters with CG imagery in the wider media culture of the time. Early computer graphics used a combination of vector graphics and raster graphics. Vector graphics, which described objects "in terms of single points connected by straight lines," could signal shape and volume through sharply defined wireframe models, but were less successful at articulating surface texture; raster graphics were more processing-intensive, controlling the appearance of each pixel in an image, but could achieve surface textures with "many subtleties of light and shade" if the number of pixels in the image was high enough (Rickitt, 2006, p. 155). Spectators encountered vector graphics in games like *Asteroids* (Lyle Rains & Ed Logg for Atari, 1979), and raster graphics in arcade video games like *Space Invaders* (Tomohiro Nishikado for Taito, 1978) (Morris & Hartas, 2004, p. 166). But they had also encountered them from the early 1970s in animated television logos and television commercials by companies like Robert Abel and Associates (Rickitt, 2006, ibid.); by the late 1970s and early 1980s, they would find them on domestic screens via the home video game console and the personal computer.[3]

This popular digital media context made contemporaneous filmmakers realise what programmers had already recognised in their work for television and video games: that computer-generated graphics could be "beautiful in their own right" (Frank Vitz, systems programmer at Robert Abel and Associates in Moltenbrey, 2011, n.p.). More specifically, the "hyper-chrominance and super-luminosity" of computer imagery in television and video games of the time "imbued the digital artefact with a special visual significance" that was also attractive for mainstream science fiction cinema (Pierson, 1999, p. 173). A good example is the famous "light cycle" sequence from *TRON* (Steven Lisberger, 1982), a science fiction film and landmark of early computer graphics in which a computer programmer is sucked into a corporation's mainframe computer system and forced to battle with programmes given humanoid form. As Dan North (2008) notes, *TRON* envisions "the inside of a computer as a vibrant, primary-coloured world where programs are represented by avatars resembling the 'users' who wrote them" (p. 129), aesthetic choices that underscore the novelty of this new electronic information processing technology, but also its clean lines and illuminated displays. The light cycle sequence was produced by MAGI (Mathematics Application Group, Inc) using their Synthavision system,

3. The Atari 2600 cartridge-based video game console popularised the domestic console in the early 1980s; the Apple II personal computer was launched in 1977, and the IBM PC in 1981.

which combined simpler geometric 3D shapes together to build sharply defined and brightly coloured vehicles. Even those who objected to the so-called "garish, candy-apple colors" of such spectacles, such as Ron Cobb, effects designer on *The Last Starfighter* (Nick Castle, 1984) (in Pierson, 1999, p. 173), embraced the well-defined lines of the computer model in their own work.

In this period of early CG images' integration into mainstream cinema, the specifically digital textures of these CG objects, their lines and surfaces, and the simulated nature of their dimensionality, were embraced rather than being disavowed. Michele Pierson (1999) is quite right to find a tension in these films between exploring the computer image's capacity for "mimesis," and celebrating "a decidedly more synthetic, visibly more plastic, mode of visualisation" (p. 173). But another tension is also evident, between a visual rhetoric of cohesion that allows digital objects a presence and function within the film world, and a visual rhetoric of fragmentation that, while it might extend into the diegetic world, points to the digital object's technological construction and artifice. A good example is the so-called "Stained Glass Knight sequence" in *Young Sherlock Holmes* (Barry Levinson, 1985), in which a priest hallucinates a knight figure in a stained glass window coming to life, producing an apparition that consists of different plates of CG stained glass that are brought together in movement, but which never cohere into a connected whole. If we return to *TRON*, we find a similar tension: the cohesion of objects and digital surfaces are asserted within the diegesis (programmes are destroyed by smashing into unforgiving digital walls, for example) but this cohesion is simultaneously undermined by the filmmakers' decision to explicitly show that much of this world seems to be constructed by wireframes. For example, the "Recognizers," large flying vehicles that detect and destroy rogue programmes, each consist of a uniform set of wireframe geometric objects that are proximate to each other but not obviously physically interlinked, a fact underscored by moments at which these "Recognizers" are forced to disintegrate (upon a forceful impact) or to be reconstructed (as when the heroic programme, Clu [Jeff Bridges], discovers a broken "Recognizer" and takes control of it, prompting its different components to re-assemble). These are self-referential nods to the process by which MAGI's Synthavision system builds the digital vehicles out of a collection of smaller objects, and to the film image's status as a digital composite. In this early period, then, filmmakers and the computer specialists working with them generate sequences in which a push-pull between seamlessness and looser forms of co-located assemblage vividly points to the distinctiveness of the CG image and its surface textures, while also foregrounding the procedural mechanics of its production.

It is the surfaces of these early geometric visions, and their distinctness from the grains and textures of everyday life, that seem to have stuck in the popular imagination, driving the digital's cultural reputation as the purveyor of "[s]crubbed, hygienic, disinfected images" (Gaudreault & Marion, 2015, p. 75). As André Gaudreault and Phillippe Marion among others have noted, in scholarly responses to the digital, anxiety about the purported loss of an indexical link to the real world has often been mapped onto fears about the consequences of encroaching digital technologisation for human existence. This anxiety is focussed on the digital surface, and on the digital composite as – or reduced to – surface, a surface "scrubbed" of the traces of human existence. In Vivian Sobchack's 1994 discussion of the electronic image, she suggests that a "hyperbolic attention to detail […] at the surface of the image" sought to compensate for the inherent "flatness" of "electronic space," and compensate for its diffusion of "the lived body's material and moral gravity" (1994, p. 115). A decade later, Sean Cubitt (2004) opines that the technological affordances of digital imaging technologies may create a circumstance in which the "accidents […] that so enchanted Bazin in the Italian neorealists disappear into a wholly ordered world" (p. 251). In both cases (and with Pierson's use of the term "wallpaper" also in mind), the digital surface becomes a rhetorical figure that threatens to cover over, to "overwrite" as it were, the world of lived experience. Yet the "material gravity" of human existence, agency, and self-expression is, for those who can afford it (Schradie, 2011), now thoroughly situated within and lived through the screens and surfaces of an expanding digital media ecology. Sobchack (1994) was one of the first to reflect on the transformative potential of a pervasive digital culture (p. 90). However, her early conclusions, which suggested that the primary effects of this ubiquity were diffusion, dispersal and disembodiment, appear less compelling in today's much more intensively digitally mediated environment, and, as Aylish Wood (2007) has pointed out, disregard the embodied nature of the quotidian experience of digital media (p. 78). How do the digital surface and the digital composite function in a contemporary setting further transformed by digital media?

Layers

Both Lev Manovich (2001) and Rodowick (2007, p. 170) viewed the dominant seamless digital compositing practices of the 1990s and early 2000s as a missed opportunity. The longer history of experimental art and video practice which had explored the radical potential of "layered and collaged imagery and text" (Willis, 2005, p. 9) offered creative precedents that computer-based tools seemed well positioned to return to, and

Manovich was quick to highlight the intriguing alternative possibilities digital compositing might offer:

> Borders between different worlds do not have to be erased; different spaces do not have to be matched in perspective, scale, and lighting; individual layers can retain their separate identities rather than being merged into a single space; different worlds can clash semantically rather than form a single universe. (2001, p. 158)

These "new aesthetic possibilities," as Manovich called them (p. 158), began to be realised in mainstream cinema from the mid-2000s onwards, from the palimpsestic credit sequences and foreshortened spaces of action films like *Sin City* (Robert Rodriguez et al, 2005) and *300* (Zack Snyder, 2006), to the spatial and temporal layering, split screen transitions and extreme deep staging of *Speed Racer* (Wachowski siblings, 2008). Prince (2012) is moved to describe such films as "insistently iconoclastic" (p. 70) in their more elastic relationship to photorealism, and in their efforts to "use digital methods to craft images in novel ways or to expand the boundaries of more traditional aesthetic designs" (p. 87). A new era of self-conscious digital compositing arrives in this period, which can be framed, as Prince does, as experiments with the affordances of digital imaging technologies in the service of producing novel commodity spectacles. However, it is also important to note the specificity of the aesthetic characteristics that these experiments share: an insistent foregrounding of the layers of the digital composite.

Digital 3D's attempt to build its market in the 2000s is one of the factors for this aesthetic tendency. Many films released in Digital 3D feature moments at which extended camera push-ins past different planes of the image or the expansion of a movement or object into its constituent layers assert the novelty of the Digital 3D experience. The digital layer is also activated in this period of the mid-2000s onwards in a nostalgic, simulationist mode, in which the digital mimics the textures of analogue technologies. Many of the films that display this characteristic look back nostalgically to earlier eras of celluloid cinema, such as *The Artist* (Michel Hazanavicius, 2011), which harks back to the coming of sound, *Hugo* (Martin Scorsese, 2011), which remembers early cinema and special effects pioneer Georges Méliès, and *Oz, The Great and Powerful* (Sam Raimi, 2013), a prequel to *The Wizard of Oz* (Victor Fleming, 1939) (Sperb, 2016, p. 4–5). These and other films from a range of genres focus on simulating analogue surface textures, from the digitally simulated celluloid scratches of *Planet Terror* (Robert Rodriguez, 2007) (see Benson-Allott, 2008, p. 21) and the continued preoccupation with the

tactile appeal of remembered toys in *Toy Story 3* (Lee Unkrich, 2010), to the digital recreation of older technologies such as clockwork in *Hugo* (Purse, 2013, p. 138–9) and microfiche in *Blade Runner 2049* (Denis Villeneuve, 2017) (Summers, 2017, n.p.).

Yet the connotations of such intermedial moments and their surface play can often exceed a nostalgic impulse. The opening sequence of *Oz, The Great and Powerful*, with its ebullient citation of past media entertainments, displays a marked insistence on the "intrinsic separability of image components" (Rodowick, 2007, p. 170). *Oz* opens in black and white, the camera pushing gently forward towards a frontally presented digital reconstruction of a paper theatre, and then past each of its different "layers" in turn (stage curtains, stage borders, painted arches). Titles ("Disney Presents"; "A Roth Films Production") are thrust in at intervals from the edges of the frame as if they are attached to rods controlled from "off-stage" These recall theatre special effects, but also shadow puppetry, an association that is cemented as a top-hatted figure's shadow is thrown onto what appears to be the back "wall" of the theatre. But the camera is still moving forward, and now, as the name "James Franco" appears on a rod, it is impossibly backdropped by clusters of swirling circles that are not animated from an off-stage space (as the other titles are). The appearance of new imagery in the sequence shifts between the replication of the mechanics of a paper theatre (a layered construction, with new flat planes or backdrops able to be slotted into place, while other elements are proffered on rods), and a more flexible collage technique only really possible in traditional animation or in digital compositing and animation. In this way the sequence begins to register its impossible construction. No longer approximating the physical constraints of a "real" paper theatre, the camera tilts up to encounter a new paper theatre space, one in which flat letters and cut out figures spin and swing. Soon the walls and arches of the paper theatre are swinging too, from side to side in rhythms that contradict each other, as if to suggest a disintegrating structure. A close-up of a cycling cardboard monkey facilitates a transition to a tunnel of ever-decreasing circles manifested in different designs, which soon becomes a kaleidoscope of circular imagery, then a visual rendering of a phenakistoscope, then other kinds of collage whose imagery recalls the vaudeville hall, the circus, and different American landscapes.

With its references to the paper theatre, cinema, revue posters, and pre-cinematic visual technologies (see Rich, 2013), the *Oz* sequence reflexively links its digitally composite nature to a history of media practices and technologies that in Sean Cubitt's (2014) words "establish layers as a component of depth construction" (p. 182) (Rich 2013).

In the service of this citational mode, the camera's push in enacts a pulling apart of the different surfaces depicted within the composite image, so that in its formal spatial arrangement it references earlier layered mediums like the paper theatre and the multi-plane animation camera.[4] At the same time, it links these past layered media to its own "palimpsestic combination of data layers" (Rodowick, 2007, p.169), locating the digital composite within a longer history of representational forms. In such moments as these, the digital composite does not simply mimic the materiality of analogue mediums, it also draws attention to its own digital materiality. The layers are explicitly artificial simulations of paper theatre components and can be combined and spatially configured in numerous ways. Here a generative play with digital surfaces in digital space is foregrounded and asserted as pleasurable, as it is in the equally energetic (albeit differently configured) opening sequence of *Speed Racer*, and end credit sequences of *Doctor Strange* (Scott Derrickson, 2016) and *The Great Gatsby* (Baz Luhrmann, 2013). What these sequences have in common is what Cubitt (2010) has called "the theatricality of layered compositions" that combine "the arithmetic structure of layers and the geometrical tools of vector graphics" (p. 26). As Aylish Wood (2007) has observed in a related context, in contrast to "seamless interfaces [that] aim to distract from the work of their construction, drawing viewers into their story-worlds," the separation of digital elements in these sequences produces "an interface with more complex spatio-temporal organizations that gesture not only towards the technological changes otherwise hidden behind a seamless interface, but towards the nature of technological encounters" (Wood, 2007, p. 162).

Orientations

Here the formal dimensions of the self-conscious digital composite exceed their narrative function and their citational function and become communicative about wider questions of lived experience and digital mediation. These "insistently iconoclastic" digital composites emerge at precisely the moment that the effects of Web 2.0's transformed internet interactions – including dynamic webpages, expanded social media networks, and participative modes of media production and reception – began to be widely experienced. As Henry Jenkins et al (2013) point out, the 2000s are marked by "an emerging hybrid model of [media] circulation, where a mix of top-down and bottom-up forces determine

4. The multi-plane camera was invented by Lotte Reiniger in 1923 (Schönfeld, 2006, p. 175).

how material is shared across and among cultures in far more participatory (and messier) ways" (p. 1). Such developments have led some writers to ponder the status of human agency in this converging and expanding digital environment. Jenkins' work prioritises the presence of human agency in circuits of reception, production, and sharing of digital media, but other writers offer more anxious accounts, directing their analyses beyond media circulation in its narrow sense to take in those data flows that implicitly structure other areas of lived experience but exceed human comprehension in their scale and operational dimensions (such as financial transactions and stock exchanges, social security and medical research, policing and surveillance). Steven F. Anderson (2017) notes that this is becoming more common, since in these "systems for capturing, storing and analyzing data" the "acceleration of processing speed and power creates incentives to capture data at a rate and scale that outpaces both the human and the computational capacity to make sense of it" (loc. 2593). In this transformed digitally mediated world, even the circulation of images is structured in ways that are difficult to parse; Shane Denson (in Denson, Grisham & Leyda, 2016) foregrounds the

> totally inhuman circulation of images today, which, in the forms of surveillance, social media (and related Web applications), and other sites of accumulation, exchange, and dissemination, impinges upon humans in various ways (both expanding and attenuating human agencies), but which despite and indeed precisely in this impingement remains in many ways indifferent to human needs. (p. 938)

While such assessments speak accurately of the ubiquity and scale of the digital information processing that underpins many areas of contemporary life; they also bear traces of older anxieties about the digital exceeding or "overwriting" the human. Mark Hansen (2006) offers a productive counterpoint to accounts that emphasise the autonomy of technology at the cost of human agency, suggesting that they fail to recognise how far human evolution has always been tied up with technology and the communication media it makes possible. Hansen builds on Bernard Stiegler's (1996) concept of the "co-originarity of technics and the human," which defines human evolution as "irreducibly both biological and cultural," and "technics" as a medium through which humans have expressed and reflected upon aspects of their environment since humans first used hand tools (Hansen, 2006, p. 299). On this foundation Hansen proposes that a medium can be defined as "an *environment for life*," one that permits "the exteriorization of living, and correlatively, for the selective actualization of the environment… an

existential domain" demarcated from the real world, but reflecting upon it (p. 300). Two points emerge from Hansen's formulation that are worth underscoring: first, that cinema forms part of the (now highly digitally mediated) lived environment, and second, that cinema can provide opportunities to reflect on that lived environment. And while there is a tendency to see experimental and gallery-based work with the digital moving image as the privileged site for reflection on the human impact of digital technologies, William Brown reminds us that mainstream cinema should not be excluded from consideration: "Thinking in/ with/ through cinema," he argues, "is an 'enworlded' mode of viewing […] the potential for a film-spectator-world assemblage to lead to thought is in any and all films" (Brown, 2013, loc. 3350). With these perspectives in mind, I want to propose that digital visual effects sequences like the ones under scrutiny in this article are part of a much longer history of media-based human communication that creates a space – or "existential domain," as Hansen terms it – for the curation of and rumination on aspects of the human environment, including the ways in which this might be structured by media or technics.

Spectators are what Cubitt (2013) calls "connoisseurs of compositing" (n.p.). Their lived experience and life knowledge are structured by a myriad of embodied encounters with digital interfaces every day. They are veterans of multiply-layered "Making Of" and VFX breakdown videos on YouTube and on DVDs extras, which separate the areas of digital effects work and post-production processing into different layers that can be peeled away or built up to give a sense of how the final result has been achieved. They are users of digital editing software for photographs or videos, or more commonly of mobile apps like Face Changer, WhatsApp or Instagram, that impose digital filters or digital artefacts over photographs. And they are enquirers of Google maps and other geolocation apps that shift back and forth between cartographic two-dimensional layers and constructed-on-the-fly three-dimensional "Street Views". Subsequently as users they are very familiar, not only with some of the processes by which people construct and combine digital images, but also with two other everyday experiences to which the *Oz* sequence knowingly refers. One is the synthesising and navigating of thickly stacked and complexly choreographed digital layers, encountered in everyday life in the multiple windows of the computer display, the shopping centre's various display screens, and the juxtaposition of the mobile screen with screens in the wider landscape. The other experience is the oscillation between two-dimensional and three-dimensional perspectives that navigating this digital landscape frequently implies, and that also commonly defines interactions with other digital interfaces,

such as the co-presence of flat (stylised two-dimensional) and skeumorphic (based on three-dimensional real world equivalents) designs on mobile device interfaces, or the encounter with a 360-degree photograph within a two-dimensional Facebook feed.

Sequences like the example from *Oz* offer a situated view of a particular kind: specifically, they seek to articulate an encounter with a digital interface, even as they fulfil their other narrative or aesthetic functions. But what kind of encounter? The frontal presentation evokes the two-dimensional nature of a digital device display, such as a computer or mobile phone screen, but with a sense of depth and proliferating layers that offers a pleasurable exaggeration of what one might normally encounter. What is evoked is the freedom of collage practice – through its literal cutting free from conventional forms of emplacement, and its basis in layers whose relationships to each other can be playfully negotiated to point up discontinuity and disjunction – combined with a deepening sense of spatial reach. An impression of a celebratory form of interactivity is created. As Wood (2007) points out, digital interfaces provide "embodied encounters that exist within and between the determinism of the interface and the choices made in viewing" (p. 161); that is, they provide situations in which human agency may still be afforded (p. 79), but within particular constraints. Speaking to the individual's own task-based location within digital media culture and the synthesising labour it requires, *Oz* and other layered sequences like it propose digital interface encounters (and the practices of on-going synthesis they demand) as a possibility-filled, effervescent and fun practice. Constrained agency is characterised as positive, as the interface's constraints produce enticing, spatially dense and temporally evolving spectacles. The intermedial gesture often embedded within these self-consciously disaggregate digital composites emphasises access and instantaneity, cinema here performing a YouTube-like "expanded access to a rich spectrum of [historical and archive texts]" (Hilderbrand, 2007, p. 48) while locating itself within longer traditions of pleasurable media production.

In this way, such sequences foreground digital media's wider narrative of individual empowerment and control. Neoliberal capitalist structures of digital commerce proffer a discourse of individual freedom in exchange for personal data, open-ended payment plans, and data tracking, for example in subscription-based streaming services, cloud-based services you need to identify yourself to in order to access, social networks where you must hand over your data and your image rights in order to participate, and so on. As Anderson (2017) notes, a cultural narrative of individual utility, freedom and access has been promoted by the purveyors

of digital technologies – in part through the forms they take – that seeks to obscure the large-scale accumulation of personal data, media, and visual data which is being used "as a basis for refining algorithms for machine vision, marketing analytics, and artificial intelligence" (loc. 1793).[5] The disaggregate digital composite's performative collage implicitly acknowledges the constraints of this circumstance but emphasises the playful agency that can still be experienced within these constraints through creative combination and juxtaposition. This is, then, one of the ways in which the disaggregate digital composite reflects on "how it feels to live in the digital age of late neoliberalism" (Julia Leyda in Denson, Grisham & Leyda, 2016, p. 945).

The Re-Emergence of Mastery

The self-conscious digital composite is sometimes shaped by more than a principle of playful agency within constraints, however. Some sequences, particularly those concerned with the navigation of digital space, the visual objectification of the digital commodity, and the staging of narrative and character trajectories, are concerned to intensify the connotations of control inherent in the digital composite. Such cases make up a strand of digital compositing practice that is overtly structured by the notion of mastery.

The popular "exploded view" in post-millennial action cinema of the 2000s is a good example. It offers a disaggregate digital composite whose constituent elements are pulled apart and examined by an often highly mobile virtual camera. Catalysed by the popularity of the bullet time visual effect in *The Matrix* (Wachowski siblings, 1999), in which a sequence of images taken from a series of still cameras is digitally sutured together to produce a virtual camera path around an object that is moving more slowly (or may have been frozen completely for the mobile camera's gaze), a cluster of related practices have emerged since, in sequences like the bomb explosion that opens *Swordfish* (Dominic Sena, 2001), or the plane crash sequence in *Resident Evil*: *Afterlife* (Paul W. S. Anderson, 2010). In each case, the different elements of the scene are held apart and their movement either slowed or entirely stilled, so that they can be offered for more intensive contemplation. It is an ostentatious visual pause that often thematises the liminal position of the protagonist at this moment of the narrative (Purse, 2013, p. 70), yet whose aesthetic properties exceed their narrative function. Evoking a style of visual

5. For example, by 2014 YouTube had amassed videos with an aggregate running time "in excess of sixty thousand years" (Anderson, 2017, loc. 1793).

presentation familiar from technical drawing, with its roots in the "phantom views" and exploded views of Marino Taccolo and Leonardo Da Vinci among others (Ferguson 1994: 75–113), the contemporary exploded view emphasises process and positionality, using slow motion to foreground both movement in depth and the graphic qualities of elements occupying the x-axis. If the collage-like sequences of *Speed Racer* and *Oz* evoke tactile forms of control, in which layers can be notionally touched and repositioned, the exploded views in films such as *The Matrix* propose the digital composite as a three-dimensional architecture that can be navigated and perused, so that the fragmentation of the composite is balanced, as it were, by a smoothly articulated analytical visuality.

In these sequences, an acknowledgment of the layered construction of the digital composite converges with a reassertion of seamlessness, this time of digitally generated diegetic space. At the same time that the different elements of the digital composite are held apart from each other in a performative fragmentation of the image, the virtual camera path (a framing of the diegetic environment achieved through digital rather than analogue means) constructs the environment as spatiotemporally continuous. Several writers describe this paradoxical image – or more particularly the impossible camera that expresses its contradictions – as "post-cinematic" (Shaviro, 2010; see also Stam, 2000). Reflecting on the implications of a virtual camera that can impossibly pass through walls and bodies at the start of *Fight Club* (David Fincher, 1999), William Brown (2013) remarks on the way in which different temporalities can be presented in digital cinema, but within a "single spatial continuity" (loc. 2308). Building on the work of Steven Shaviro (2010, p. 77) and Gilles Deleuze (1986,p.83), he suggests that digital cinema

> tells us that all points in space […] coexist simultaneously, even if we humans cannot normally see them. Furthermore, access to these points in space is made easy in digital cinema: it can be achieved in single, continuous, and fluid shots. (Brown, 2013, loc. 1229)

Shane Denson (in Denson, Grisham & Leyda, 2016) agrees with Brown that the virtual camera becomes non-anthropocentric in the post-cinematic mode; since it is discorrelated from human vision, it becomes, for Denson, a key site for

> coordinating, relaying, or concretely mediating the new relations […] between "the cinema screen" and "viewers" positions within a larger environment of post-cinematic screens, and more generally between post-cinematic media and the displacements or peripheralizations of human agencies to which they correspond. (p. 940; see also Denson, 2016)

While this can manifest in various ways, in the exploded view discussed above an explicitly compensatory form of self-reflexivity is legible, where dynamic, mobile access to the spatial and temporal architecture of the digital interface offers a fantasy of visual mastery in the face of the post-anthropocentric dimensions of the contemporary digital ecology.

This compensatory mode finds its apotheosis in the celebrations of hyperrealist digital (or digitally-enhanced and composited) surface textures that have become commonplace in the end credits and occasionally the opening title sequences of mainstream commercial cinema, from *Snow White and the Huntsman* (Rupert Sanders, 2012) and *Pacific Rim* (Guillermo del Toro, 2012), to *The Avengers* (Joss Whedon, 2012) and *Crimson Peak* (Guillermo del Toro, 2015). Such sequences have become popular in part because of the pragmatic sharing of 3D modelling assets between a film's visual effects vendors and its credit sequence designers to help speed the credit sequence completion along (Perkins, 2013, n.p.). Yet they also offer a compensatory illusion of mastery that is based on freedom of movement through and scrutiny of the digital landscape; through, that is, the digital provision of "a three-dimensional space made up of many textures and granularities, and the means to move within it" (William Uricchio, 2011, p. 30). For example, in *Pacific Rim*, which adapts the Japanese mecha and *Kaiju* genres in a story of humans piloting giant robots in order to fight invading monsters, the end credits focus entirely on a hyperrealist examination of the giant robots' surface textures. A mobile camera captures robots frozen mid-gesture in an indeterminate display environment. Close-ups repeatedly train the eye on the robots' high-gloss, polished bodywork. The camera declines a static position on the scene in favour of "fly-bys" that macroscopically scrutinize surface textures from multiple mobile positions in a pattern of slow and fast movements. This pause-and-move rhythm evokes an admiring gaze, such as the act of turning an object in your hand, or moving around a sculpture to get a better look; or, in another context, an automobile advert's visual rhetoric of bodywork display. But it also evokes various forms of digital interface through its location in an indeterminate space of display and consumption that is more legible as a computer- or data-space than a real world setting. The constantly shifting camera suggests the analytical gaze of the visual effects artist, working through a 2D interface with a 3D modelling package like Maya, and shifting the model into different positions within digital space in order to refine its surface features. It also suggests the re-positionable viewpoints and layered digital spaces of geolocative interfaces like Google Earth ("Orbit the world in 3D" invites the on-screen guidance to version 9.2.50.0) and the location mapping functions of social media apps like Snapchat and

Facebook. Here the consumer's constructed (and frequently partial or illusory) position of mastery over interfaces and information is invoked in the visual rhetoric of the sequence and conflated with the assertion of the robot technology as a commodity worthy of objectification.

As a result, like other sequences of its ilk, the *Pacific Rim* sequence enacts a striking over-determination of the exchange value of the digital object, through an ostentatious re-imposition of seamlessness. The obsessive attention to digital surfaces celebrates the robots' narrative status as triumphant technology, their commercial desirability as cinematic spectacle and ancillary product, and their manifestation as state-of-the-art 3D modelling and texturing. The disorienting or fragmented aspects of multiplying digital interfaces are elided, and digital space is imagined as the navigation environment for a totalizing, consumerist mode of vision that is available to the individual at the swipe of a touch screen, or the flick of a computer mouse. Here the camera push in and the foregrounding of digital space do not simply reflect aspects of the wider digital media culture, they are complicit in shaping its reception. Anderson suggests that media artefacts "teach us how to understand the technologies that make them possible […] [and work to produce] neoliberal subjects ready to accept their role in the marketization of everyday life" (2017, loc. 5421). These end credits sequences participate in this wider process, the intermedial gesture embodying a set of material relations, between digital production, consumption and acculturation.

Mastery is also at issue in the self-conscious digital composite's deployment in the negotiation of representational norms. At pivotal narrative moments the disaggregate layers of the digital composite provide a site at which, more often than not, spatial penetration is re-connected to male power. A good example is the disaggregate digital composite that occurs at the culmination of *DREDD* (Pete Travis, 2012), which articulates the overthrow of the film's villain. *DREDD* is a comic book adaptation about a law enforcer in a dystopian future city who has the power to investigate, judge and punish crime without recourse to a traditional court jury system. Judge Dredd (Karl Urban) is pursuing female crime lord Ma-Ma (Lena Headey), who deals in a narcotic called "Slo-Mo" that slows the perception of time in the user. The pursuit centres on a volatile high-rise block that Ma-Ma dominates, and at the end of the film Dredd catches Ma-Ma, giving her a dose of Slo-Mo and then pushing her through a plate glass window to her death from the top of the block. Ma-Ma's death fall is captured in a series of disaggregate digital composites from the side and above and below; within each shot, shallow staging and slow motion combine to pull background, mid-ground and foreground image elements

apart, presenting her falling body, the shattered, glittering window glass, and the block environment in collage-like arrangements of 2D and 3D artefacts. The power to contravene an image plane sits squarely with the white male, while the female must suffer its consequences. Early in the sequence there is a point of view shot from the falling Ma-Ma as she gazes defiantly at a slowly receding Dredd in the shattered window frame, his pushing hand still raised as glass shards glitter around him. The final shot of the sequence shows her fatal impact at ground level as if through glass from directly below: in close-up her head turns slightly, then the impact forces her skin to compress and rupture, blood spreading out across the image, filling the screen while a pull focus transforms the gore into aestheticized and sanitised unfocused pools of red and white. It is as if Ma-Ma has been stopped at the cinema screen itself.

Like the *Pacific Rim* sequence, here slow motion enacts an intensified attention to surface details, an assertion of digital materiality that advertises the control over the image that the digital promises, and celebrates it through studied, decorative artifice. Like the *Oz* sequence, the pulling apart of the digital composite allows a nexus of intermedial references to unfold. The sequence's bright yellows, reds, blues and greens reference the original comics' cover art (*2000 A. D.,* 1977–), but also Instagram photo filters. Ma-Ma's hubris condemns her to a literal plunge from the heights of the high-rise, her falling pose and the soft, out of focus highlights constructing a narratively pertinent visual reference to Gustav Doré's "The Fall of Lucifer" (1866). At the same time, the digital layer becomes the site at which the film unwittingly reveals its continuing commitment to older forms of vision. Ma-Ma is violently stayed at the cinema screen in a recapitulation of traditional perspectival organization that refuses the multi-perspectival and multi-vectoral possibilities of digital vision and digital movement. The gendered logic by which Dredd pushes, and Ma-Ma is pushed, and by which Dredd can shatter the screen with his actions, but Ma-Ma cannot, illustrates that this film's narrative interest in structures of control extends to its own preservation of dominant conventions of spatial and social organization.

Conclusion

Today's self-conscious digital composite reflects on its milieu in heterogeneous ways. Of the various tendencies emerging, this article has focused on two that are particularly preoccupied with the digital layer, and with questions of agency. While in some sequences a disaggregate digital composite enacts a playful but compromised agency through its palimpsestic, pulling and pushing collage-based practice, others offer a

more explicit, and often explicitly masculinist, fantasy of absolute mastery of the digital composite's visual textures, spaces and structures. In the face of digital transformations of spaces of vision, data, and experience, cinema is clearly thinking its relation to the wider digital media culture. These sequences evidence a self-reflexive play with the constituent layers of the digital composite as part of this thinking through, becoming in their formal architecture an example of what Denson has called "media-aesthetic embodiments of our era's ongoing transitionality" (in Denson, Grisham & Leyda, 2016, p. 964). There is a tension between an embrace of fragmentation and a return to cohesion, and a fascination with the multiplying perspectives and orientations that digital media culture can provide. But there is also evidence of a continuing preoccupation with the singular unified view, and the normative gendering of spatial reach and spatial penetration. Far from empty spectacles or affectively flattened cinematic experiences, these self-conscious digital composites offer embodied encounters both inside and outside the narrative, which rehearse in different ways the spectator's agency, positioning, and creative potential inside today's digital communication flows. Here mainstream cinema finds spaces in which to contemplate a fast-evolving digital landscape and the possibilities for play and agency that exist within it, just as the spectator must reflect on their own possibilities for play and agency in a digitally transformed environment for life.

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