Screen Space

Reconfigured

EDITED BY

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MediaMatters

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Susanne Ø. Sæther and Synne T. Bull

Introduction: Screen Space Reconfigured

Susanne Ø. Sæther and Synne T. Bull

Immersed in digital 3D stereoscopic vision, we float in a low orbit above Earth's atmospheric threshold, which glows blue against an otherwise black screen. A velvety, thick silence fortifies the authenticity of this sensorial encounter made possible by way of seamless integration between cinematographic excellence and high-performance computation. In this visually immense opening sequence of director Alfonso Cuarón's film *Gravity* (2013), a few minutes later we see astronaut Dr. Ryan Stone (Sandra Bullock) being hurled into the depth of space after a deadly shower of space debris severs her lifeline to the ship. Our gaze trails Dr. Stone's detachment and subsequent spin into the far distance. Within one continuous camera movement, and as such distinct from its 20th-century emblematic predecessors, *Gravity*'s virtual camera moves from a buoyant overview increasingly closer until at some point we effortlessly penetrate the thin layer of the protective visor into the inner helmet's claustrophobic atmosphere.[1] The shot ultimately cuts to Dr. Stone's point of view, i.e. into her head. This is the 21st-century plastic screen space tailored for a floating spectator, where any connection regardless of scalar, material, or temporal disparities can be rendered into a coherent, elastic, and convincing cinematic space. Measured by its revenues as well as critical appraisal, *Gravity*'s employment of the capabilities of digital 3D to create a novel, seamless rendering of deep as well as proximate space was heralded as a victory for linear, theatrical

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1   Perfectly tailored to the vacuum in outer space, the shot for a second reverberates Dr. Frank Poole's (Gary Lockwood) soundless spin into the void, caused by supercomputer Hall's bad-tempered behaviour in Stanley Kubrick's revolutionary *2001: A Space Odyssey* (1968), as pointed out by Stuart Bender in "There is Nothing to Carry Sound".

cinema in an age characterized by cinema's radical relocation to new arenas and platforms.[2]

Gravity presents us with a configuration of on-screen spatiality—or what we with an art historical terminology could call pictorial space—that is distinct for 21st-century moving images. As outlined in detail above, this is a profoundly malleable cinematic space that, through visceral effects, invites continuous floating and traversal across vast distances, across cosmic and earth-bound positions, physical boundaries, and the threshold between human and non-human agents. *Gravity* thus seems to confirm William Brown's claim of digital cinema more generally, that it tends to favor an intensified and unbroken spatial continuity that 'suggests a mastery of space that is beyond the abilities of the analogue camera alone' but within the capacities of the virtual camera.[3] With digital 3D, the continuity effect is further amplified, played out along the z-axis and into the space of the spectator. Indeed, by now, *Gravity* has become an emblem of the viability of digital 3D cinema, with this hyper-continuous, stereoscopic spatiality as its main draw.[4] However, as Thomas Elsaesser has convincingly argued, digital 3D is but 'one element among many' that is 'resetting our idea of what an image is and, [and] in the process, is changing our sense of spatial and temporal orientation and our embodied relation to data-rich simulated environments' in the 21st century.[5] Echoing Erwin Panofsky's seminal work on the Renaissance linear perspective, for Elsaesser 3D is a 'symbolic form' for this century; an emblem of a whole set of novel spatial configurations and relations dispersed across contemporary screens. As Elsaesser contends, the proliferation of new spatial renderings that we are seeing across 21st-century screens does not simply produce a particular kind of view but also corresponds to the production of an 'ideal spectator' who is 'floating, gliding or suspended'.[6] Ultimately, what these new spatial configurations amount

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2   For a discussion of the dual conception of 'deep space' (both as the vastness of cosmos and as cinematic space) produced through the skillful use of 3D in *Gravity*, see Sarah Atkinson, "Gravity – Towards a Stereroscopic Poetics of Deep Space".

3   Brown, *Supercinema*, p. 44.

4   See Spöhrer, ed., *The Aesthetic and Narrative Dimensions of 3D*, for a collection of essays that investigates the 'aesthetic and narrative space of possibilities for 3D film' as it has resurfaced in its digital iteration, thereby claiming the creative and economic viability of digital 3D (p. 22). Whereas Spöhrer's volume overlaps in some sense with the present in its foregrounding of emerging on-screen spatialities, it does so within the constraints of stereoscopic cinema rather than seeing these novel 'spaces of possibilities' as part of a larger setting of spatial configurations.

5   Elsaesser, 'The "Return" of 3-D', p. 240, 221.

6   Ibid., p. 221.

to is a set of novel relations between the human, embodied spectator and her environment.

With this volume, we follow Elsaesser's lead and set out to explore the many other novel spatial configurations that, like digital 3D, may be seen to partake in an overall repositioning of the embodied spectator in relation to the screen-saturated milieu of the 21st century. Importantly, while digital 3D may be the paradigmatic example of emerging spatialities of the 21st century, it is only one. Under the compound concept of screen space, a term that is further discussed below, the present volume assembles eleven case studies from a selection of expert voices across the disciplines of film and media studies and art history in order to present a timely analysis of some of the multiple reconfigurations of spatial tropes, conventions, and representations we currently encounter across a range of contemporary screens. In addition to digital 3D cinema, which is the main subject of two of the essays included here, the essays solicited for this volume cover a wide range of contemporary spatial configurations as encountered in moving images. Among them is the tendency towards so-called 'vertical framing' and variable aspect ratios presently seen across a range of screen practices, and the axial (re)orientations of the spectator's position in relation to mobile screens, as such screens increasingly are used not only for consumption but also production and thereby foreground a proximate spatiality. An intriguing co-presence between proximity and distance is exemplified by the haptic interfaces of touchscreens as evoked in recent video art, which through their conjunction of (touchable) flatness and (perceptual) depth recall the stacked tableaus of early cinema, yet now within the perceptual and computational parameters of 21st-century digital media.

As should be evident from these examples, the cases of reconfigured screen space examined in this volume span from highly professionalized screen practices, like mainstream cinema, to amateur ones such as mobile phone videos; from art, including experimental film and video installations, to mass attractions such as holograms projected at stadium concerts. Our cases also span a range of different moving-image technologies and viewing contexts. Apart from the fact that the spatial configurations explored in this volume are experienced, in one way or another, as new or reconfigured, they share the following features: they are encountered in moving images as these are displayed on and by screens, and they surface prominently—either at the centre or at the forefront—of 21st-century media culture.

By the phrase '21st-century media', we here want to foreground two dimensions, one quantitative and one qualitative. First, we use the phrase as a straightforward demarcation of a given timeframe: roughly the last two

decades. The majority of cases explored here are from the present century, and the book as such is firmly established within a contemporary discourse, while some essays offer important contributions of historical precedents. Secondly, our use of the term is informed by Mark B. Hansen's conception of the 21st century as an era that has seen a fundamental reordering of the relationship between human sense perception and medial operations that makes it substantively different from the 20th century's versions. From Hansen's far-reaching theorization of 21st-century media, we find particularly relevant his claim about the fundamental incompatibility between, on the one hand, human sense perception and faculties, and on the other, the computational processes of contemporary media.[7] According to Hansen, 21st-century media differs from the previous century's media forms in that while they 'open up an expanded domain of sensibility that can enhance human experience', they also work at scales—micro and macro—that make these operations not only unfathomable but outright inaccessible for any human capacity.[8] Yet these operations still 'impact our sensory lives in significant ways', but they do so 'through embodied and environmental sensory processes' that we cannot consciously or perceptually grasp.[9] As such, Hansen points out, 21st-century media marks a 'shift from agent-centred perception to environmental sensibility', wherein human agency is dispersed across and configured by the networked, computational media that make up our contemporary living environment.[10]

Whereas the very processes and operations of 21st-century media may be ungraspable for our human sensory capacities, these media however also do have a perceptual side: they display images and information we perceive through hearing and sight, and the devices that these operations are relayed through are habitually touched and handled. Guiding the conceptualization of this volume is our contention that the manner in which 21st-century media produce and represent space for our perception ultimately impinges on the question of the position of human agency and experience in the current medial environment.

That we here assume 21st-century media to be qualitatively different from the modern media of the 19th and 20th centuries does not, however, imply that the empirical examples of screen space explored here are considered to represent a fundamental rupture with earlier spatial forms and

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7   Hansen has put forward this claim in his book *Feed Forward: On the Future of Twenty-First Century Media* (2015), based on his revisionist reading of Alfred North Whitehead's philosophy. Yet it is traceable throughout his previous scholarly production.

8   Hansen, *Feed-Forward*, p. 4.

9   Ibid., p. 38.

10   Ibid., p. 5.

configurations. Rather, as is evident in many of the essays, we see continuities and discontinuities form across a sedimented media culture, in line with the media archeological approach advocated by Erkki Huhtamo and Jussi Parikka.[11] Indeed, whereas some of the spatial configurations considered in this volume may appear unprecedented and genuinely new, a number of them have clear precedents in the 19th and 20th centuries, including proto-cinematic attractions, early cinema, and avant-garde art. These are historical practices taking place at earlier moments that, like the present, are marked by intensified medial transformation and experimentation. Nonetheless, while contemporary configurations of screen space may have their 20th-century precedents, their resurfacing in the networked, computational moving image culture of the 21st century make for novel spectatorial perceptions and experiences.

The Concept of Screen Space

The compound concept of 'screen space' is crafted for this volume to provide an umbrella term for a number of different but related tendencies in the representation, production, and perception of space within 21st-century screen culture. First off, we admit that the term itself—*screen space*—could appear confusing rather than clarifying, combining two terms that are already tenuous. As is well established, the term 'screen' has multiple meanings in the English language. In Erkki Huhtamo's outlining of a 'media archaeology of the screen', or what he terms 'screenology',[12] we find the following quote from the *1911 Century Dictionary and Cyclopedia* (originally published in 1889), which demonstrates the range of this term's meanings:

> [a] covered framework, partition, or curtain, either movable or fixed, which serves to protect from the heat of the sun or of a fire, from rain, wind, or cold, or from other inconvenience or danger, or to shelter from observation, conceal, shut off the view, or secure privacy; as, a fire-screen; a folding-screen; a window-screen, etc.; hence, such a covered framework, curtain, etc., used for some other purpose; as, a screen upon which images may be cast by a magic lantern; in general, and shelter or means of concealment.[13]

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11   Huhtamo and Parikka, *Media Archaeology*.
12   Huhtamo, 'Screenology; or Media Archaeology of the Screen', p. 78.
13   Ibid., p. 77.

We can, in this early definition, identify two fundamental meanings of the term that are of particular relevance for the spatial emphasis of this book: the screen as an object that divides and thereby defines physical space (screen as a 'covered framework, partition, or curtain' that protects, shelters, conceals); and the screen as a means for transmitting and displaying images ('a screen upon which images may be cast by a magic lantern'), which, in turn, represents space in certain, conventionalized ways.

The former conception of the screen can be traced back to texts from at least the 16th century, where, as Huhtamo notes, the screen designated a 'contrivance for warding off the heat of fire or a draught of air' as listed in the *Oxford English Dictionary*.[14] The latter conception of the screen, which foreshadowed the contemporary understanding of screen as a means for transmitting and displaying images, emerged during the early 19th century. One of the earliest such examples recorded by the *Oxford English Dictionary* dates back to 1810 and described the highly popular entertainment known as the phantasmagoria. Further expounded by Noam M. Elcott in this volume, the phantasmagoria featured one or more Magic Lantern projections on semi-transparent surfaces, smoke or wall, using mirror or rear-screen techniques to hide the source of the image. By the end of the 19th century, the word *screen* was being used as a metonymy to represent and refer to the cinema 'as the art of the screen, as opposed to the theatre as the art of the stage'.[15] As electronic and digital technologies of producing and displaying moving images have been added, however, 'the screen' has become the connecting term between the many different technologies and devices on and through which moving images are experienced, be they small or big, projected or electronically transmitted via power-activated liquid crystals.

In this volume, we acknowledge this duality inherent in the concept of 'screen': the screen both as an object that in itself has spatial extension and that parts and defines the physical/actual space in which it is placed, and as a surface/means for displaying images holding their own spatial representations. Referring to Huhtamo again, we also acknowledge that screens, although two-dimensional surfaces, often elicit an experience of three-dimensionality extended through a variety of representational and technological means, such as surround sound and stereoscopic vision systems.[16] Our main focus in this book, however, is the spatial renderings within and on the screen surfaces themselves; what one within an art

14   Ibid., p. 82.
15   Chateau and Moure, 'Introduction: Screen, a Concept in Progress', p. 14.
16   Huhtamo, 'Elements of Screenology'.

historical terminology could call pictorial space. Screens, as Huhtamo points out, 'are also framed, which metaphorically associates them with paintings or windows', a notion elaborated extensively by Anne Friedberg in her two books *Window Shopping* and the *The Virtual Window*.[17] Even less settled than the concept of screen is, of course, the concept of space, to which a multitude of diverse scholarship has been devoted. We return to this topic in our discussion of recent treatments of space in film and media theory below.

Despite these potential misgivings, we have sought to craft the combined term 'screen space'. We have done so on the basis of purely empirical and pragmatic grounds. 'Screen' here simply designates any surface containing or displaying images, be it reflective or projective, whereas 'space' refers to the way any spatial dimension—be it room, field, landscape, site, architecture, or environment—is represented on and by these surfaces. Hence, what the present volume specifically addresses is the screen as a surface for projection or electronic emission of moving images, which represent, produce, or express spatial relations, many of which currently appear as reconfigurations or intensifications of earlier spatial tropes and conventions. In short, it is predominantly *on-screen space* that is the analytical focus of the volume; that is, the spatial relations we see on the screen. However, any discussion of on-screen space will by implication amount to a reflection on the demarcation of this space against both off-screen space or the hors-champ/out-of-field, as well as the physical space in which the screen itself is placed, variously referred to as the space of the spectator, the space of the auditorium, or the space of the gallery, depending on the context. This demarcation between on-screen space and its outsides is of concern in some of the essays in the volume, but not as their core subject. Hence, whereas we foreground and focus here on on-screen space, on-screen space is seen to both reflect and partake in an overall shift in the production and perception of space as such. It is in this sense that *Screen Space Reconfigured* is devoted to the analytical, critical, and theoretical examination of the novel spatiality rendered by and on 21st-century screens.

A Spatial Turn in Film and Media Studies?

Since around the millennial turn, one can discern at least four (partly overlapping) trajectories in film and media theory and analysis that have

17   Friedberg, *The Virtual Window*.

increasingly emphasized the importance of the spatial dimension. While being informed by these developments to various degrees, the present volume synthesizes and carves out an additional position in ways that are expounded below. First, what has been labeled a 'spatial turn' within media studies can be traced throughout the previous decade, as convincingly argued by André Jansson and Jesper Falkheimer.[18] Arguably spurred by the resurgence of theories of space across the humanities and social theory at the end of the 20th century as well as the intensified mediatization of society brought on by digital, networked technologies, the spatial turn in media studies foregrounds the increasingly complex relationship between space, technological use and distribution, and mediated communication and information.[19] Notable contributors to this 'turn' are, for example, Anna McCarthy, Nick Couldry, Lisa Parks, Rob Kitchin, and Martin Dodge, who all have critically examined the material infrastructures, everyday experiences, social conditions, and/or power relations produced across various cases of medial-spatial arrangements.[20] Another subfield within this 'spatial turn' is the increasing number of studies devoted to globally dispersed sites of media production and consumption and the flows between them.[21]

A core insight driving the spatial turn in media studies is that '(t)hinking about space today requires thinking about *media space*', as Stephen Monteiro has claimed: media 'do not merely penetrate or occupy space' but also 'produce and shape it'.[22] As implied in Monteiro's echoing of the title of Henri Lefevbre's seminal study *The Production of Space*, media studies' spatial turn is indebted to French critical theories, if filtered through the resurgence of theories of space across the humanities and social theory at the end of the 20th century. In addition to Lefevbre, the works of Michel Foucault, Michel de Certeau, Guy Debord, Marc Augé, Jean Baudrillard, and Paul Virilio are field-generating, 'all of whom explore the spatial characteristics of power relations, technological deployment, and the generation of meaning in

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18   Jansson and Falkheimer, *Geographies of Communication*, p. 7.

19   For influential theories of space within social and globalization theory, see for example Bhabha, *The Location of Culture*; Soja, *Postmodern Geographies*; Soja, *Seeking Spatial Justice*; Soja, *Thirdspace*; Harvey, *Spaces of Global Capital*; Jameson, *Postmodernism*; Jameson, *The Geopolitical Aesthetic*.

20   McCarthy, *Ambient Television*; McCarthy and Couldry, *MediaSpace*; Parks, 'Earth Observation'; Parks and Starosielski, *Signal Traffic*; Parks, *Rethinking Media Coverage*; Kitchin and Dodge, *Mapping Cyberspace*; Kitchin and Dodge, *Code/Space*. For a far more nuanced outline of the different positions within the spatial turn in media studies than what is possible in this context, see Monteiro, 'Rethinking Media Space'.

21   See for example Hallam and Les Roberts, *Locating the Moving Image*.

22   Monteiro, 'Rethinking Media Space', p. 281; Lefevbre, *The Production of Space*.

post-industrial Western societies', as Monteiro summarizes.[23] Whereas the fundamental insight of the deep entanglement of media technologies and their uses with the social repercussions of spatial production also informs the present volume, its core focus, cases, and methodologies depart from those that fall under the rubric of media studies' spatial turn in significant ways. Most obviously, many of those studies draw heavily on ethnographic methodologies, theories of communication, globalization theories, and/or the field of human geography, whereas the site of theoretical and analytical intervention in this volume is a much narrower focus on on-screen spatial representations and relations as brokered by contemporary screens.

Second, in the same period, the field of film studies has attempted to come to terms with the migration of cinema onto multiple platforms, materialities, institutions, and spaces, ushered in by digitization. Unbound from celluloid, film projector, and the single screen of the auditorium, the cinema of today is to be found on mobile phones, architectural structures, and geographical sites, in galleries and museums, and dispersed in networks and pixels. To grasp this new condition, film theorists have mobilized metaphors and a terminology of a decidedly spatial nature. As Vinzenz Hediger has remarked, André Bazin's ontological query '*Qu'est-ce le cinéma*? (What is Cinema?)' (1964) has thus been reformulated repeatedly by film scholars to a question of topology and what is perceived as the far more pressing '*Où est le cinéma*? (Where is Cinema?).'[24] Sarah Atkinson, for one, has taken this question as a point of departure for her empirical case studies of what she has called 'emerging cinema': that is, contemporary cinema that takes place 'beyond the screen' and the conventional theatrical setting, yet still somehow afford cinematic expressions and experiences.[25] Other spatial conceptions of cinema's material, social, and cultural migration are Francesco Casetti's notion of 're-located cinema' and Timothy Corrigan's notion of a 'cinema without walls', the latter proposed already in 1991 when cinematic migration was budding through new patterns of film viewing and production installed by technologies such as VCRs and cable TV.[26] Titles such as *Cinema Beyond*

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23   Monteiro, 'Rethinking Media Space', p. 281.
24   Hediger, 'Lost in a Space and Found in a Fold', p. 61. See Dercon, 'Gleaning the Future from the Gallery Floor'; Casetti, 'Filmic Experience'; Hagener, Where is Cinema (Today)? pp. 15-22.
25   Atkinson, 'Beyond the Screen. Emerging Cinema and Engaging Audiences', pp. 1-15. Among her examples are so-called 'event-led' cinema, in which film screenings are augmented by elements such as synchronous live performance, site-specific locations, social media engagement, and various simultaneous interactive sensory experiences including eating, smelling, and dancing.
26   See Casetti, 'The Relocation of Cinema'; pp. 1-12; Casetti, 'Cinema Lost and Found'; and Corrigan, *Cinema Without Walls.*

Film (2010) and *Mapping the Borders of Cinema* (2012) also illustrate the prevalence of a spatial vocabulary to chart the demarcation of cinema in the 21st century, as does the revitalization (and arguably, reduction) of Gene Youngblood's concept of 'expanded cinema' to designate the range of new platforms and contexts onto and into which cinema is migrating.[27] Indeed, Hediger has suggested that we take this abundance of spatial metaphors seriously and see them as markers of an inherent spatiality of film theory itself.[28]

While Hediger's suggestion has produced a welcome foregrounding of the 'topological undertow' in film theory, this volume takes another route.[29] Here we look instead for cases of spatialities and topologies not in film theory but in the contemporary moving image itself. In so doing, this book finds a model in scholarship of early cinema, particularly within the new film history advocated by Thomas Elsaesser and others, which are considered by some to be a branch of media archaeology.[30] The spatial focus in early cinema is addressed by Mary Anne Doane, Antonia Lant, Giuliana Bruno, Tom Gunning, Miriam B. Hansen, and Wanda Strauven, to mention but a few.[31] For our purposes, what is central in much of this scholarship is its historically informed sensitivity 'to the construction of a space [...] which is typical of the cinema' and irreducible to its pre-cinematic antecedents, as Elsaesser has stated.[32] This volume aims for equally sensitive analyses of the construction of spaces that are typical of and distinct for contemporary moving image practices as they unfold across a range of different screens, if not without antecedents, or yet reducible to them. Moreover, early film scholarship stands as a model, as on-screen space is frequently considered in continuity with both its technological-material underpinnings and the social and sensorial experiences it effects. A touchstone is, of course,

27   Albera and Tortajada, *Cinema Beyond Film*; Koch, Pantenburg, and Rothöhler, *Screen Dynamics*. See Pantenburg, '1970s and Beyond', for a perceptive discussion of the often reductionist employment of Youngblood's notion of 'expansion' as a purely spatial term in contemporary discourse, which does not acknowledge the consciousness-expanding call at the core in Youngblood's book.

28   Hediger, 'Lost in Space and Found in a Fold', p. 62.

29   Ibid.

30   Elsaesser has in several texts outlined the non-teleological thrust of new film history as a form of media archaeology. See for instance Elsaesser, 'The New Film History as Media Archaeology'.

31   Doane, 'Scale and the Negotiation of "Real" and "Unreal" Space in Cinema'; Lant, 'Haptical Cinema'; Gunning, 'An Unseen Energy Swallows Space'; Hansen, 'Early Cinema: Whose Public Sphere?'; Hansen, 'Early Cinema, Late Cinema'; Bruno, *Atlas of Emotion*.

32   Elsaesser, 'Early Film Form: Articulations of Space and Time', p. 12.

Tom Gunning's persistent inquiry into cinema's spatial dimensions, most seminally put forth in his notion of a 'cinema of attractions' in which the performative oscillation between the 'inside' (illusion/image) and 'outside' (display/apparatus) of cinema 'brought focus back onto the specific spatial and social construction of cinematic experience'.[33]

Third, and perhaps most correctly seen as a subset of the second trajectory or at least overlapping with it, the same period has seen the emergence of a research field dedicated to 'moving image art' in which the issue of spatiality has featured prominently. Indeed, the art world is one of the new habitats in which cinema currently thrives. If a somewhat tenuous term, 'moving image art' has come to serve as a pragmatic designation that signals the art world's institutional assimilation of practices across the range of film and video, including analogue and digital video art, celluloid film, multimedia installations, internet-based works, sculptural film objects, as well as the odd feature film.[34] The generic tenor of the term also heralds that, at least materially speaking, the medium-specific boundaries between 'film' and 'video' are harder to sustain after digitization. Much of this scholarship is concentrated on a very particular feature of this art—the condition that the image in these works tends to be projected.[35] Frequently the projected image is also dispersed across multiple screens in the gallery, as demonstrated in the work of artists such as Eija-Liisa Ahtila and Isaac Julien. Several studies within this fast-expanding research field contribute to productively recasting the genealogies of film and video through their shared recent spatialization within the gallery. However, works within this trajectory have tended to emphasize the relationship between the projection and the physical space in which it is placed, the 'hybrid' condition between white cube and black box that results, and the

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33   Gunning, 'Cinema of Attractions'; Dell'Aria, 'Spectatorship in Public Space', p. 20.

34   For an overview of some of the objections to the term 'moving image art', see Leighton, Introduction, p. 11. The terms 'moving image art' and 'projected-image art' are in this discourse frequently used alternatingly and overlappingly.

35   A starting point for the prevalence accorded to projection in this discourse is arguably the exhibition *Into the Light. The Projected Image in American Art 1964-1977*, which was curated by Chrissie Iles for the Whitney Museum of American Art in 2001. Iles also published a comprehensive catalogue that accompanied the exhibition, which drew on theorization of Minimalism as well as histories of artist's film and video to develop a theoretical framework in which the physical space of projection was emphasized. *Into the Light* and its emphasis on the relationship between projection and its spatial and architectural surroundings set the tone for the subsequent discourse on moving image art. See Trodd's introduction in her book *Screen/Space: The Projected Image in Contemporary Art* for a more detailed account of the impact of *Into the Light* on the theorization of moving image art.

novel spectator positions and embodiments this situation opens up. Only to a very limited extent do they engage with the on-screen spatiality on offer. A case in point is the excellent book *Screen/Space* (2011) edited by Tamara Trodd, wherein projection is held forth as a defining feature for much of the film and video works shown in art galleries and museums in the 21st century.[36] In her introduction, Trodd states that the book's aim is to develop a new theoretical framework 'which is properly attentive to the specificity of the gallery space in which it is often found, as well as to the fuller artistic and cultural history with which it often engages'.[37] Thus, despite the book's title (which our own title for this volume echoes), it seems that, in this case, it is the physical space in which the screen and projection are placed that have priority. On-screen space is not met with the same critical or scholarly attention. Scholarly studies on moving image art provide a highly welcome integration of perspectives from art history with film and media theory and history and provide an invaluable platform for further inquiry into the ongoing spatialization of the moving image and its relationship to its physical locations. While drawing on this discourse, the present book diverges from it in that it explicitly gives priority to and seeks to analyze key features of contemporary on-screen space across a wide range of screens and screen practices.

In addition to these three trajectories, the same period has seen a number of publications devoted to the intersection of media screens and (urban) architecture, frequently emphasizing the shaping and experiences of public spaces that results. Perhaps less a defined research field or unified discourse than the other trajectories, this branch of scholarship on the spatial dimension of contemporary media tends to foreground the movement of images, bodies, and screens in and through spaces and the mobilization of space that ensues. Notable contributors to this discourse are Giuliana Bruno and Nanna Verhoeff, both of whom are represented in this volume. Embodied experience and the performative navigation through such spaces, either through mobile and/or locative media (Verhoeff) or these spaces' intensified multi-sensory address (Bruno), is pivotal for these scholars, frequently conceptualized through cartographic terminology.[38] Here, it is the amalgamation of on-screen space and its surrounding environment that is of interest, which is what makes their contributions highly relevant for this book.

36   Trodd, *Screen/Space.*
37   Ibid.
38   See for example Bruno, *Atlas of Emotion*; Bruno, *Surface*; and Verhoeff, *Mobile Screens.*

The amalgamation of on-screen space and its physical surroundings is also at the core of a recent strand of spatial scholarship within media studies, which has surged with the growing ability of images to work 'operationally' and the increasing dissemination of 'transparent' screens and immersive technologies, such as virtual reality (VR) displays, across both professional and consumer practices.[39] Bringing together much of this research is the illuminating volume *Image – Action – Space. Situating the Screen in Visual Practice* (2018), edited by Luisa Feiersinger, Kathrin Friedrich, and Moritz Queisner. Here the merging of images and operations are explored with a view to how resulting practices situates viewers in spaces within and beyond the screen and how these spaces in turn structure users' actions and perceptions. Many of the essays in *Image – Action – Space* examine the procedures, practices, and technologies involved when images serve as tools for action and navigation. While the active and operational dimension of images are acknowledged by several authors also in the present volume, its scope differs in that here the emphasis lies on their aesthetic and experiential dimensions rather than their production and use. Included in *Image – Action – Space* are several case studies of VR, which is indicative of the recent turn towards immersive screen technologies and experience in the media industry, and increasingly also in art.[40] Through such technologies, the elasticity and enveloping qualities of contemporary screen space and its attendant 'floating' spectator position, which, as shown, was so emblematically crafted through digital 3D in *Gravity*, is further intensified. This recent surge in scholarship on VR and AR is a significant and timely addition to the spatial discourses in art and media studies, with the potential to recast some of the theoretical and analytical underpinnings of spatial discourse in relation to screens and the very concept of 'screen space' that this volume rests on. Most importantly, of course, with VR and head-mounted displays, the screen and its framing function is no longer perceptible, replaced by a 360° view with the viewer having 'no possibility to look away'.[41] In this volume we have nonetheless chosen to delimit our scope to cases and perspectives that are somehow premised upon the presence of the screen as a 'classical'—and

39   The seminal concept of 'operational images' was coined and developed by artist and film-maker Harun Farocki in the early 2000s. In Farocki's often quoted words, operational images are 'images that do not represent an object but are part of an operation.' Farocki, 'Phantom Images', p. 17.

40   That high-profile artists such as the performance artist Marina Abramovic, installation and light artist Olafur Eliasson, and painter Bjarne Melgaard all recently have made VR works illustrate that VR is no longer relegated to the sphere of media artists.

41   Neddermeyer, 'I Want to See How You See', p. 203.

perceivable—tetragonal frame.[42] The reason for this is simply that we want to show how space and spatiality currently is reconfigured not only at the technological vanguard of contemporary screen culture but also within established media forms such as mainstream cinema and 'regular' video installations. In keeping our focus on contemporary on-screen space, we aim to intervene at a point that is curiously under-researched in spatial discourses in media studies and attendant disciplines.

As can be seen from the above discussion, relations between conceptions of space and screen are multiple and varied. While not making an overarching claim about this relation, our contention in this volume is simply that in order to grasp the complexities of the contemporary entanglement of media and space, on-screen spaces and their precise formal, material, affective, and sensory configurations must also be part of the equation. The present volume seeks to deliver such a contribution to spatial thought within film and media studies.

Screen Space Reconfigured

The aim of this volume is, as mentioned, first and foremost to probe novel and resurfacing configurations of space as they appear across 21st-century screens. In order to do so, it brings together eleven focused case studies that explore spatial tropes, representations, and perceptions ranging from—and crossing between—contemporary mainstream cinema, experimental film, video art, mobile screens, and everyday screen practices. Indeed, the present volume is guided by the contention that these diverse practices are deeply interrelated. Work by scholars such as Anne Friedberg, Thomas Elsaesser, and Tom Gunning are exemplary for the conceptualization of the present volume in this respect as well. In addition to their (media archaeological) charting of spatial tropes, practices, and configurations across disparate historical moments, their non-hierarchical (and synchronic) probing of such configurations across vernacular, popular, mainstream, and avant-garde media forms within a given moment of time is also formative for the volume. It should be noted that the essays in this volume predominantly lie within the methodological scope of aesthetic and to some extent material analysis. In order to efficiently foreground the aesthetic and experiential characteristics

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42   Noam M. Elcott's chapter in this volume is an exception, in that he explores historical and contemporary iterations of what he calls the phantasmagoric dispositif, in which images and spectators seem to share the same space.

of emerging on-screen spatialities, we have chosen not to include industry or audience studies among our cases. Whereas we do not aim to chart or claim an overarching theoretical framework for the exploration of what we see as an ongoing reconfiguration of 21st-century screen space, we do want to acknowledge that many (but not all) of the essays foreground the sensory and affective experiences effected by novel spatial configurations and/or the agency of technology itself. Engaging analytically and theoretically with these emerging configurations of screen space as they impinge upon issues of media materiality, perception and sensation, the volume ultimately also engages the question of the place of the human within these configurations.

In her chapter, Giuliana Bruno theoretically approaches the material condition of the film medium and the surface of the screen. Conceptualizing the screen as an environment of 'projection', Bruno understands projection in broad terms as 'an architecture of passage' which, while being a real environment, is a space of relations where texture, materiality, surface, and light play important roles as the visual and spatial meet and are remediated. For Bruno, materiality is not a question of the materials themselves but of the substance of material relations. As such, she is interested in the spaces that are made or taken up by these relations, showing how they are configured on the surface of different media.

William Brown's chapter 'Knowing Not What To Believe: Digital Space and Entanglement in *Life of Pi*, *Gravity*, and *Interstellar*' investigates the computer-generated imagery (CGI) in the feature films mentioned in his title. Brown offers theoretical perspectives that explore the forms of viewer engagement that specifically digital camera perspectives and computer-generated moments activate. In the digital renderings of space that these three films offer, the viewers are put in a position of uncertainty regarding where the CGI begins and ends, and in terms of not knowing what should be accepted as 'real' within the narrative of the film. This uncertainty encourages the viewer to choose what to believe is true or real, that is, to intellectually engage and interact with the film. Brown argues that this interaction is linked to the assumed non-indexicality of digital images, which are thought of as infinitely modifiable. Because they are 'virtual' rather than indexical, these images present non-anthropocentric perspectives and 'impossible' virtual camera movements—which are found in all three films—in a powerful manner. With reference to Karen Barad's concept of entanglement, Brown also argues that the ways in which the digital cinematic images show a virtual conquest of space reinforce the viewer's sense of *not* mastering space in the same way, reminding the viewers instead of their entanglement with space in our real-world existence.

In her chapter 'Digital 3D, Parallax Effects, and the Construction of Film Space in *Tangled 3D* and *Cave of Forgotten Dreams 3D*', Kristen Whissel investigates how the return of stereoscopic 3D as a digital medium prompts a rethinking of the history of moving images in ways that take into account the changing dimensionalities of moving images and transformations in the articulation of film space. With new means for organizing film images not only around the horizontal and vertical axes of the screen space but also in terms of depth, digital 3D images address the spectator in what Whissel calls 'a different temporal and affective register'. Through close readings of the films *Tangled 3D* and *Cave of Forgotten Dreams 3D*, Whissel looks specifically at the ways in which negative and positive parallaxes promote different perceptual experiences and construct digital film spaces. Accordingly, she argues, they force us to rethink the history of cinema as a history of the dimensionality of the moving image.

Nanna Verhoeff also takes contemporary 3D cinema as an object for probing potential new epistemologies, seeing it as a tool for the production of space in time. In her chapter 'Surface Explorations: 3D Moving Images as Cartographies of Time', she explores the question of whether the trope of navigation in 3D moving images can work towards an intimate and haptic encounter with other times and other places. The particular navigational construction of space in time in 3D moving images can be considered a cartography of time. This is a haptic cartography of exploration of the surfaces on which this encounter takes place. Taking Werner Herzog's film *Cave of Forgotten Dreams* (2010) as a theoretical object, the main question addressed is how the creative exploration of new visualization technologies—from rock painting and principles of animation to 3D moving images—entails an epistemological inquiry into, and statements about, the power of images, technologies of vision, and the media cartographies they make.

Miriam Ross' essay 'Reconfigurations of Screen Borders: The New or Not-So-New Aspect Ratios' interrogates how moving image framing configurations determine our understanding of on-screen and off-screen space. While Ross' examples for this investigation are cinematic—*Life of Pi* (Ang Lee, 2012), *Oz the Great and the Powerful* (Sam Raimi, 2013), and *The Grand Budapest Hotel* (Wes Anderson, 2014)—she situates the changing frame configurations as conditioned by mobile phone usage, evident from the increasingly ubiquitous vertically framed moving images on social media sites, as a phenomenon that draws attention to a radical challenge to traditional screen culture. According to Ross, the wider historical contexts in which screen and frame borders have been experimented with have not

been given much critical attention. Although digital technologies have made it easier to reconfigure the frame's borders within the duration of the same film, Ross points out some of the historical experiments that have taken place. As more recent examples, *The Grand Budapest Hotel*'s shifting aspect ratios and *Oz the Great and the Powerful* and *Life of Pi*'s stereoscopic imagery condition the viewer's sense of proximity—immersion—or distance from the visual fields, thus affecting how different modes of embodied viewership are encouraged and experienced. Ross argues that the physiological processes at work when aspect ratios change within the same film are not limited to the eye's ability to process on-screen and off-screen content. The viewer's synesthetic and kinaesthetic sense of being is also affected when the on-screen space expands and contracts, and it is our bodies as well as our eyes that negotiate this proximity and distance.

Allan Cameron's essay 'Face, Frame, Fragment: Refiguring Space in Found-Footage Cinema' explores the ways in which the face holds a privileged position—not only as a figure in classical cinema acting as marker of identity or site of affect but also as a spatiotemporal anchorpoint in the configuration of screen space—by closely interrogating a number of contemporary experimental 'found footage' films. These films, which include Peter Tscherkassky's *Instructions for a Light and Sound Machine* (2005) and Gregg Biermann's *Spherical Coordinates* (2005), remix and recycle found footage from narrative cinema, using techniques such as collage and montage in order to experiment with the face's role in organizing proximity and distance, flatness and depth. The works, Cameron argues, reorganize the relations between face and frame, splitting them into discrete fragments while at the same time setting them up in new, experimental configurations. Space is thus 'dynamically *refigured*'—modified into different forms as well as articulated around distinguishable faces and objects. The viewer is thus invited to reflect upon the codes and structures that are constitutive of cinematic space. As such, Cameron argues, these experimental films not only highlight the special position of the face in classical cinema but simultaneously bring to attention the different ways in which we face cinema itself in the post-cinematic era.

In her chapter 'Looking Up, Looking Down: A New Vision in Motion', Jennifer Pranolo uncovers a genealogy of photographic space that ruptures the conventional idea of it as 'mirror' or 'window' onto the world. Instead, she offers ideas of ambiguous and synthetic space, which act as perspective games and eye exercises. Looking back at Moholy-Nagy's call for a New Vision (1929)—which advocated for photography as an infinitely resourceful tool for

encouraging spectators to explore the visual and cognitive terrain of a new spatial logic—Pranolo considers what such a strong imperative to see the world with different eyes means for us today. With new digital technologies of the image, including computer screen interfaces on which the medium of photography increasingly finds its mode of production and display, our understanding of photographic space once again requires revision. The discussion focuses on the role of the human body—both the viewer's and those located within the picture—in negotiating the increasingly peculiar spatial possibilities that images offer. Pranolo's chapter offers analyses of three aesthetically and historically disparate examples—Elad Lassry's post-'Pictures Generation' work, László Moholy-Nagy's techno-utopian rhetoric of modernist photography, and the life-sized illusion of the Ames room (Adelberg Ames, Jr.)—which nevertheless intersect in their common use of the body as a pivot point for introducing spectators to the spatial paradoxes that can proliferate within the photograph.

In her essay 'Touch/Space: The Haptic in 21st-Century Video Art', Susanne Ø. Sæther charts a tendency that has marked video art since 2010: the co-presence between the motif of the hand that touches the screen and a distinctly layered spatiality. As Sæther argues, this co-presence—which is clearly informed by the influx of touchscreens in consumer culture—demonstrates an imbrication of the sense of touch with a distinct, proximate spatiality that productively can be conceptualized as haptic. Critically deploying a set of various notions of the haptic culled from film and media theory as well as perceptual psychology, Sæther discusses Trisha Baga's lo-fi 3D video *Flatlands* (2010) and Victoria Fu's immersive video installation *Belle Captive I* (2012) and expounds a contemporary haptic space that verges between planarity and volume, between the near and far, and that exceeds the frame to enfold us. The discussion shows how, in both works, natural elements like sunsets, sleet, and rain merge with medial elements to evoke the ambient and 'atmospheric' media of the present decade, in which 'devices and infrastructures have become part of the background of life, operating below the threshold of sensing'.[43] As such, Sæther argues, what these video works ultimately point to is the split between human sense perception and the networked, computational operations of 21st-century media that Mark B.N. Hansen has described, but also the attempt to grasp this split.

Axial tension between horizontality and verticality is at the centre of the following chapter, in which Miriam De Rosa and Wanda Strauven

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43   McCormack, 'Elemental Infrastructures for Atmospheric Media', p. 419.

consider the relation between screenic orientations and production and reception practices across a variety of screen-based devices. More specifically, they investigate examples of how axial repositioning or rearrangements of the screen occur in the passage from production (screen as work surface) to reception (screen as display surface). Using the term 'reorientation' to explain such phenomena, they use various case studies from contemporary filmmaking and visual arts to approach a specifically contemporary form of spatiality in which not only the literal orientation of the screen (and screenic image) matters but also the situations of production and consumption that might take place along different spatial axes. Moving between practical and conceptual terms, the authors suggest that axial reorientation implies a pragmatic shift based upon a reconfiguration of the patterns of use and the space involved but also that this variation in screen usage implies a more profound change mirrored in our ways of conceptualizing the screenic device. To address this, the authors couple their emphasis on the screenic (re) orientation with an inquiry of the new forms of gesturality these screen spaces require and inspire.

In his essay, 'Nothing Will Have Taken Place Except Place: Redefining Place Through Cinema', Tom Gunning begins in 1897, shortly after the emergence of cinema and shortly before the death of Stéphane Mallarmé, who threaded the phrase used in Gunning's chapter title through his culminating work of modern poetry *'Un Coup de Dés'* [A Throw of the Dice]. As Christophe Wall-Romana has shown in his recent work on cine-poetry, Mallarmé was very aware of the new invention the cinématographe. The unique sense of visual movement found in this poem's typography may well reflect his contemplation of the new medium. Michael Snow, commenting on his 1967 film *Wavelength*, another radical work of modernist vision, invokes Mallarmé's phrase and sets us thinking about how the moving image recreates, explores, and questions the nature of place. The radical role of the moving image in providing new modes of our experience of space has been neglected or simply presented as a deviant deconstruction of a dominant commercial narrative cinema. Taking seriously the way the moving image provides new tools for our understanding of our place in a technological world, Gunning discusses moments of camera movement and the mobile frame in cinema practice, both commercial and avant-garde, historical and contemporary, exploring how camera movement affects the viewer's perception of virtual motion in a manner that transforms our relation to the image. The chapter traces how the concepts of space and place can act as guiding points when attempting to understand the image

in motion and what it does to us. Challenging the notion that place signifies rest and space movement, Gunning uses examples from the films *Gravity* (2013), *Vertigo* (1958), and *Wavelength* (1967) to argue that the avant-garde impulse in cinema, similarly to modernist works in other media inspired by the moving image, never simply denies or destroys the impression of 'illusion' or 'realism' that cinema is capable of creating. Rather, the virtue of camera movement is to play with this impression of physical transportation while viewers stay fixed in their positions, thereby complicating and even contradicting the impression of virtual movement.

Moving beyond the framework of the tetragonal screen, Noam M. Elcott in his essay 'The Phantasmagoric Dispositif: An Assembly of Bodies and Images in Real Time and Space' explores spectatorial configurations in which images and spectators appear to share the same time and space, seemingly freed from the material constraints of screens and frames. The coordinated disposition of disparate elements—image space and real space, as well as technical configurations—into a mode of spectatorship that dissolves the experienced spatial and material differences is what Elcott calls the *phantasmagoric dispositif.* The phantasmagoria, or 'assembled ghosts' as the term indicates, was originally an attraction from the late 18th and early 19th century, where spectators were immersed in darkness and ghost-like figures were projected onto translucent screens or clouds of smoke so that they appeared to enter the same space as the spectators. More broadly, as a phenomenon that dissolves the boundaries between images and their surroundings, the phantasmagoric is something that refuses both categorization and medium specificity. Therefore, according to Elcott, neither art history nor film studies—disciplines that until recently have focused on individual media, technologies, genres, artists, movements, styles, or subjects—recognize phantasmagoria as a fundamental configuration of image and spectator. By establishing phantasmagoria as a precise term to describe an assembly of bodies and images in a shared time and space, Elcott locates the deep media archaeological roots and myriad contemporary manifestations of such phenomena, and accordingly points to an expansive history of cinema that has largely been ignored due to the focus on medium specificity in cinema and art alike.

As the above essays demonstrate, this volume centres on the conception that the impingements of the emergent reconfiguration of screen space are by no means demarcated by the edges of the screen. Rather, screen space is seen to partake in an overall reconfiguration of production and perception of space as such.

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1. Surface Tension, Screen Space

Giuliana Bruno

Abstract

My work questions how material relations can appear on the surface of different media—on film and video screens, in gallery installations, or on the skins of buildings and people. In response to these issues, I propose to approach materiality as a surface condition. Focusing on screen surface, I show that technologies of light can produce new forms of materiality. In this text, the screen emerges as a site of encounter and admixture. Various experiments of screening are considered, ranging from those envisaged by László Moholy-Nagy to the contemporary installations of Krzysztof Wodiczko. In these configurations of the act of screening, different forms of mediation, memory, and transformation can take place. This is what I call 'the surface tension of media'.

Keywords: Screen, materiality, surface, media, moving image installation art, László Moholy-Nagy, Krzysztof Wodiczko

> There exist what we call images of things,
> Which as it were peeled off from the surfaces
> Of objects, fly this way and that through the air. [...]
> I say therefore that likenesses or thin shapes
> Are sent out from the surfaces of things
> Which we must call as it were their films or bark.[1]

For Lucretius, the image is a thing. It is configured like a piece of cloth, released as matter that flies out into the air. In this way, as the Epicurean philosopher and poet suggests to us, something important is shown: the

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1   Lucretius, *On the Nature of the Universe*, pp. 102-103.

material of an image manifests itself on the surface. Lucretius describes the surface of things as something that may flare out, giving forth dazzling shapes. It is as if it could be virtually peeled off, like a layer of substance, forming a 'bark' or leaving a sediment, a veneer, a 'film'. This poetic description and its philosophical fabrication go to the heart of my concern in this text, which addresses matters of surface and especially of screen fabric.

In reflecting on the configuration of the screen, I expand here upon a central concern of my book *Surface: Matters of Aesthetics, Materiality, and Media*, in which I turn to the concept of surface in order to investigate the place of materiality in our contemporary world.[2] In this age of virtuality, with its rapidly changing materials and media, what role can materiality have? How is it fashioned in the arts or manifested in technology? Could it be refashioned? I ask these questions at a time when contemporary artists themselves appear preoccupied with materiality in different forms and are questioning the material conditions of their mediums. Take, for example, Francis Alÿs' moving-image work *REEL–UNREEL* (2011), an homage to the resilience of cinema as a cultural archive. The camera follows a reel of film as it unrolls through the old part of Kabul, pushed by children like a hoop to create an improvised narrative of the city. Here, at the very moment of film's obsolescence or demise, a reel of film can take on a particular significance and can be refashioned into a different object as it becomes transformed into a way of unfolding space and reimagining urban relations. I argue that, in this transformative way, there is potential for a reinvention of materiality in our times. In claiming that it is visibly and actively pursued in the visual arts and in residual and textural forms, I set out to open up a space for its theorization. Most important, I contend that materiality is not a question of the materials themselves but rather concerns the substance of material relations. I am interested in the space of those relations and in showing how they are configured on the surface of different media.

In thinking about the surface of things, the architect Le Corbusier wrote that 'architecture being […] the magnificent play of masses brought together in light, the task of the architect is to vitalize the surfaces which clothe these masses'.[3] This idea inspires the theoretical direction I propose in approaching materiality as a surface condition. The surface is here configured as an architecture: a partition that can be shared, it is explored as a primary form of habitation for the material world. Understood as the material configuration of the relationship between subjects and with objects, the surface is also viewed

2   Bruno, *Surface*.
3   Le Corbusier, *Towards a New Architecture*, p. 37.

1. Francis Alÿs (in collaboration with Julien Devaux and Ajmal Maiwandi), *REEL-UNREEL*, 2011. Video installation, 19:00. Installation view, Francis Alÿs: *REEL-UNREEL*, David Zwirner, New York, 2013. © Francis Alÿs. Courtesy of the artist and David Zwirner. Photo: Maris Hutchinson / EPW Studio

as a zone of encounter and admixture, a site of mediation and projection, memory and transformation. Furthermore, as we consider that art, architecture, fashion, design, film, and the body all share a deep engagement with superficial matters, we can also observe how surfaces act as connective threads between art forms and how they structure our communicative existence.

This larger theoretical premise about surface materiality leads me to consider the material condition of the film medium and to specifically address the surface of the screen. I propose making a material turn in visual studies in order to vitalize the surfaces that clothe the material of our objects and to show that, in our times, materiality manifests itself in projection, in the surface tension of media. In particular, I aim to theorize the screen as an environment of 'projection', understanding projection in the largest sense of the term—as an architecture of passage—while highlighting texture and materiality, surface, and light. Projection is indeed a space of relations, and it is becoming an actual environment. Architects are increasingly turning the façades of their buildings into screens, making them into translucent surfaces as permeable and layered as skins, and artists are reinventing the art of projection. We as visual theorists can contribute concrete reflections on these intersecting architectures if we think further of our own reflective surface: the projective mode and visual

plasticity, the sartorial texture and opaque transparency—that is, the luminous material transference—that is our medium.

It is time to design an alternative genealogy for the screen, not simply conceived as a window or a mirror. Departing from the metaphors of optical framing that have long circulated in film theory, I propose to think haptically of a luminous screen-membrane or screen-fabric. In fashioning the projective space in this way, I mean to emphasize the surface condition, the textural manifestation, and the support of a work as well as the way in which it is sited and mobilized in space. I am particularly interested in the play of materiality that is brought together in light on different 'screens', and in offering a theorization of the actual material fabric of the screen, outside of figuration. I am also interested in exploring the migratory patterns of such visual fabrications, and in tracing their material histories. This investigation of screen cultures thus concerns the archaeology of media as well as their shifting geographies.

Such concern for a material geography runs deeply in my work. From an early call to exit the prison-cave of the movie house, I have worked to affirm the hapticity and mobility of film architectures through an expanded notion of cinema. The act of 'streetwalking around Plato's cave' suggested a desire to explore film not as an isolated and enclosed domain but rather as a mobile, shifting terrain.[4] In further mapping the projective space, I have emphasized that the activity of projection includes a psychic interplay and modalities of affect as well as other relationships. Screens are a moving architecture in which spectators are engaged and participate in constructing environments of 'public intimacy'.[5] In other words, screens are spatial formations that are relational.

This geography of exhibition suggests that cinema is a variegated landscape, for there is a historical variety of moving-image exhibition in space. The function of the screen cannot be understood if we ignore that cinema is materially connected to other forms of display and if we overlook a consideration of these modes of exhibition. Screens are in fact a material architecture that emerges in dialogue with other arts and exhibition practices—including, historically, the birth of the museum. The public museum was in fact configured in its modern form in the same age of visual display that gave rise to the cinema, the defining art of modernity, and it shares with film that surface of communication that is the visual, theatrical architecture of spectatorship. The cultural function of the screen evolves in conjunction with the visual arts and in interaction with their surfaces and volumes.

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4   Bruno, 'Streetwalking around Plato's Cave', pp. 110-129.
5   Bruno, *Atlas of Emotion*; and Bruno, *Public Intimacy*.

To recognize this relationship of art to film exhibition is particularly relevant in any attempt to address contemporary culture. When we approach the visual architecture of our times, we confront a hybrid, shifting landscape. Modes of reception in the visual arts and media are becoming more fluid and increasingly mobile. The exhibition of film images has exited the space of the movie house; screens have multiplied, and different forms of viewership and locales have emerged. As moving images have migrated, they have established a solid presence as light spaces in the art gallery and the museum. As a result, film itineraries have become increasingly linked to museum walks. This migration of screens has strengthened the relationship between art, architecture, and moving images. The architectural wall and the gallery wall are not only becoming more like light spaces, they are at times even turning into literal screens.

It is therefore crucial that we consider the geography and mobility of exhibition and engage closely in matters of surface and screen space by making a material turn in visual theorization. In order to address the projective space more concretely, I will now turn to a specific aspect of material culture and tackle the material history of the screen. We will look at its emergence as a medium and outline an experimental theorization of its architectural surface to construct a different materiality for the screen. The excursus that follows begins with the archaeology of the act of screening and then links avant-garde experiments in screening to our contemporary, mobile forms of exhibition. In linking pre-filmic to post-filmic conditions, and concluding with contemporary moving-image installation art, I aim to further highlight the shifting history of the screen surface, its textural quality, and fundamental hybridity as a projective space.

Media Archaeology of the Screen

In developing the notion that the screen is an architecture and, in turn, creates an environment, it is fruitful to engage the form of its material history, for it displays aspects of a cultural history. The history of the screen is inscribed in what Jacques Rancière calls the 'surface of design', and it is written into the interesting, morphing etymology of the word *screen*.[6] The origin of the term points to a great variety of mediums, surfaces, and types of screening, mostly emerging from the material world of architecture.

6   Rancière, *The Future of the Image*, pp. 91-108.

2. Pae White, *MetaFoil*, 2008. Cotton, wool, polyester, and Trevira, 2895 cm x 1097 cm. Stage curtain for the Oslo Opera House theatre. Photo: Erik Berg. Courtesy of the artist, the Norwegian National Opera and Ballet, Public Art Norway, and neugerriemschneider, Berlin.

The word *screen* appeared during the Renaissance, evolving from an earlier Germanic root that also transferred to Latin languages. It usually designated, as Erkki Huhtamo shows, 'a floor-standing piece of furniture, consisting of a sheet of lighter, often translucent material (paper, some kind of fabric) stretched on a wooden frame (or series of connected, folding frames)'.[7] By the nineteenth century, this fabrication of the screen—its textural materiality—unfolded into a new kind of fabric. The form of a translucent membrane interestingly expanded to encompass a surface of projection. Joining architecture to precinematic media, the term arrived at defining a plane for the transmission of luminous images. It is significant to note that *The Century Dictionary and Cyclopedia,* published originally in 1899, defines the screen first architecturally, as 'a covered framework, partition or curtain [...]; as, a fire-screen; a folding-screen; a window-screen', but then includes in this form of observational veiling of space 'a screen upon which images can be cast by a magic lantern'.[8]

7   Huhtamo, 'Elements of Screenology', p. 35. For an overview of various aspects of screen studies, see Kuhn, ed., *Screen*. For a treatment of the screen as form, see, among others, Paul, 'Screening Space', pp. 244-274; Wasson, 'The Networked Screen', pp. 74-95; and Friedberg, *The Virtual Window.*

8   As cited in Huhtamo, 'Elements of Screenology', p. 31.

The history of the screen's evolution teaches us that what we now call *screen*, and understand to be a projective surface, originated in the world of objects, material space, and interior design. The screen was a thing. It was an object of furniture, a domestic item that inhabited interiors. It specially acted to negotiate inside and outside, and it materially transformed space. When deployed to divide space in the home, a screen mediated between private and public zones of habitation and could create privacy and intimacy. The folding screen often presented itself as a framed surface that filtered and diffused light and was also richly illustrated with images. Its fabric quality emerged from its being also a form of window dressing. The screen was even more than a visual fabric, however. It was a piece of material culture, a matter of decoration and adornment. And this ornament could be ornate in many ways. There were portable versions of it in the form of hand-screens, which could even respond to a personal ornamental desire. In its many configurations, the screen had a real plastic visibility, and yet it was an imaginary structure. Its material substance could activate, animate, and mediate the dimension of the imagination. In other words, the screen was a veritable piece of 'interior' design.

It was this particular object of décor that made possible a visual, imaginary passage, in such a way foreshadowing our current sense of what a screen is and what potential forms of 'projection' it may hold for the future. It is such a thing that we find both reflected and projected in our own screen world. When encountering the screen as an object, in fact, we can experience at a tangible level how the fabric of the screen—its projective potential—stems from a history of folding together architecture and interior design with moving images in luminous forms of imaginary projection. From the very beginning, the screen was constituted as a space of passage in which art forms could become connected.

This material history shows us that the screen is a space of crossovers in which the visual and the spatial arts come into dialogue. The screen is a vessel: it is the material support onto which proliferations of images can come into being and, in luminous passage, also flow in time across media conditions. As such a material medium connecting art, architecture, and film, the screen is a stretchy fabric: it is the site of intermedial projections. On this pliant, reflective surface, mediatic shifts can take place materially, becoming palpable to our senses in surface tension.

In probing the 'surface of design', we can sense the variety of intermedial transits that are written on screen surface. When we trace the history of its design form, we can expose the rich potential of screen space, including how it functions as a passage, a transitional site, and even a relational space. If

I keep pursuing 'the surface of design', it is because, as Rancière notes, 'by distributing surfaces, one also designs partitions that enable one to partake in communal space, [...] configurations of what can be seen and what can be thought, forms of inhabiting the material world'.[9] Forms of 'superficial' envelopment in the visible world involve the sensible realms of texture and inhabitation. Theorizing the screen in this way, I want to emphasize that the surface comes into play here as a partition in which one can partake. It 'mediates' by acting as a material configuration of how the visible meets the thinkable and as a form of sensible dwelling in the material world.

The Screen in Experimental Film Theory

To advance further in this material theorization of the screen as a transitional architecture and to design screen space as an environment, we can also take a cue from the poet and critic Vachel Lindsay. In 1915, when Lindsay offered his pioneering theorization of cinema in his book *The Art of the Moving Picture*, he recognized the capacity of the screen to be an architecture of passage and to cross over between interior and exterior worlds.[10] He located such capacity in the profound hybridity of this form. For Lindsay, the possibility of crossing worlds afforded by the art of the moving picture was inseparable from a motion across art forms. In pointing to the potential of the filmic screen, he described its material form as 'sculpture-in-motion', 'painting-in-motion', and 'architecture-in-motion' and even considered the screen a form of 'furniture-in-motion'.[11] In emphasizing how the screen constitutes an architecture-in-motion, he called attention to its capacity to create and convey surfaces and textures. On the surface of the screen, Lindsay affirmed, 'tones, textures, lines, and spaces take on a vitality almost like that of flesh and blood'.[12]

A few years later, the tensile hybridity of the screen as a form of projection came to be theorized and practiced in the work of László Moholy-Nagy. A transdisciplinary artist who pursued his ideas in mediums extending from painting to photography to design, Moholy-Nagy considered light

9   Rancière, *The Future of the Image*, p. 91 (English translation modified slightly by the author. Original English translation: 'distributing surfaces, one also designs divisions of communal space. [...] configurations of what can be seen and what can be thought, certain forms of inhabiting the material world.').

10   Lindsay, *The Art of the Moving Picture*.

11   Ibid., see chapters 8, 9, 10, and 11.

12   Ibid., p. 95.

3. László Moholy-Nagy, *Ein Lichtspiel schwarz weiss grau* (Lightplay Black White Gray), 1930. Black-and-white film, silent, 6 min. Film stills. Courtesy of Harvard Film Archive.

to be a material connection between media. His kinetic sculpture *Light-Space Modulator,* which was made into a film in 1930, explored light as an architecture, in moving, projected form. For this artist, light was not only a space per se but something that could transform—*modulate*—sites as a tangible material of projection.

In his book *Painting Photography Film*, published in 1925, Moholy-Nagy articulated this spatial modulation theoretically.[13] Here, light becomes the connecting thread between film, photography, and painting, insofar as it is an essential material condition of viewing. Light is a sensitive material that appeared creatively in painting to activate a sense of vision in motion before it was acted upon chemically in the age of mechanical reproduction. Moholy-Nagy connects together 'Painting with Pigment to Light Displays Projected'.[14] He theorizes luminosity across media and texturally relates 'the material pigment and the material light'.[15]

Speaking about painting with light in his 1936 essay 'Light Architecture', Moholy-Nagy further interweaves painting, film, and architecture, proposing to transform bidimensionality into a plastic, luminous plane with a form of projection that would animate all of their surfaces.[16] Different textures might be created, he contends, with materials that respond to projected light in such a way that the surfaces could change and morph. Moholy-Nagy makes painting, architecture, and film into surfaces of movement and potential transformation by emphasizing the textural as a quality in these media that capture luminous spectrums.[17]

13   Moholy-Nagy, *Painting Photography Film*. Antonio Somaini provides a useful commentary in his introduction to the Italian edition. See Somaini, 'Fotografia, cinema, montaggio', pp. ix-xi.
14   Moholy-Nagy, *Painting Photography Film*, p. 11.
15   Ibid., p.12.
16   Moholy-Nagy, 'Light Architecture', pp. 15-17. On Moholy-Nagy's engagement with exhibition, see Elcott, 'Rooms of Our Time', pp. 25-52.
17   On this subject see Smith, 'Limits of the Tactile and the Optical', pp. 6-31. The essay shows the extent of Moholy-Nagy's interest in materiality and texture as it continued also through the work of his students, including Otti Berger, who developed a tactile theory of fabric.

This haptic discourse of textural, luminous materialities involves a pioneering theorization of the screen and of the activity of projection. Rather than ignoring the screen or underplaying its function, Moholy-Nagy devotes significant conceptual thinking to its architecture. He recognizes the powerful presence of the screen as a surface and considers it a material in itself, an entity that should be looked at not only in relation to figuration. In this view, the screen comes into play as a veritable material siting for the image. And in this sense, the screen, as a space, can be 'architected' creatively. In a chapter of *Painting Photography Film* significantly titled 'Simultaneous or Poly-Cinema', Moholy-Nagy suggests that the screen could be configured in different forms and made into diverse planes and shapes:

> One can, for example, visualize the normal projection plane being divided by a simple adapter into different obliquely positioned planes and cambers, like a landscape of mountains and valleys. [...]

> Another suggestion for changing the projection screen might be: one in the shape of a segment of a sphere instead of the present rectangular one. [...] More than one film [...] would be played on this projection screen; and they would not, indeed, be projected on to a fixed spot but would range continually from left to right or from right to left, up and down, down and up, etc. [...] Two or more events [...] will [...] combine and present parallel and coinciding episodes.[18]

In Moholy-Nagy's imaginative experimentation, the screen ends up being constructed spatially—in the form of a 'landscape'. As such a landscape, this screen has multiple planes and can offer different possibilities for vistas and viewpoints.[19] The technological expansion of planes that is possible on screens signals an increased capacity 'for simultaneous acoustical and optical activity'.[20]

As Moholy-Nagy relates the screen to a modern landscape of simultaneity, he does not disregard the acoustical dimension. The surface of the screen reflects the modern capacity to articulate a landscape that is also made of different impressions of sounds. Such capacity is embodied in the metropolis, which is itself understood as a screen. For Moholy-Nagy, the surface of

18   Moholy-Nagy, *Painting Photography Film*, p. 41.
19   Ibid., p. 43.
20   Ibid.

the screen ultimately has an acoustical texture. The artist likens it to the simultaneous array of sounds made by the means of transport that mobilize an urban landscape. In this tonal sense, the landscape of Moholy Nagy's poly-cinema becomes, indeed, polyphonic.

Conceived as a polymorphic '-scape', this landscape-screen is subjected to inventive planar mobilization. Moholy-Nagy's screen not only can be architected in different shapes; it also can be split and multiplied. Challenging the figure of the single screen or the fixed geometry, the artist champions multiple projections. He imagines screening 'a sequence of pictures simultaneously' and 'projecting extra prints of the running film-strip on to the screen through projectors standing next to one another'.[21] This multiple screen is a tensile surface. It is a membrane that can enable simultaneity, parallelism, and the polyphonic combination of heterogeneous situations.

Understood as such a landscape, the surface of this polyphonic screen activates a movement of spectatorial positions. Moholy-Nagy pushes the conceptual experimentation of the screen in order to mobilize the actual process of film projection. When he suggests forging screens of different geometries and proposes combining them in simultaneous projections of movement, it is in order to arrive at a different architecture of viewing. The screen is thus understood as a complex location, and it is eventually even freed from being a fixed place. Creating a screen that is a landscape in motion, Moholy-Nagy ultimately conceives of the possibility of freeing the projection screen itself from static placements, thus polyphonically imagining a mobile, 'expanded' cinema.

Reflections on the Screen's Polyphonous Membrane

In the avant-garde experiments and experimental theory of László Moholy-Nagy, we find many elements of connection with the experimental and 'expanded cinema' practices of the 1960s, which in turn relate to some of the directions that today's media practices and artistic enterprises have taken with regard to the screen.[22] Although still lacking in sustained

21   Ibid.
22   A number of experimental and 'expanded cinema' practices of the 1960s built on the ideas of earlier avant-gardes regarding screening. Think of Andy Warhol's Exploding Plastic Inevitable, with its multi-screen visual and sound environments; Stan VanDerBeek's *Movie-Drome*; Paul Sharits' locational film environments; or Harry Smith's screenings on projectors standing next to one another. For a survey of this rich field of experimentation, see Leighton, *Art and*

theorization as an entity, especially outside of figuration, the screen has by now, as I have noted, come to inhabit our lives in multiple forms. In fact, the geometry of the screen has become not only ever-present but also multiform. The entrance of the digital has made it possible to articulate the potential of the screen to hold different planes, host simultaneity, and enhance combinations and connectivity. The diversified language of the screen has turned into an actual material condition of our existence. In an articulated simultaneity, virtual movements are taking place on an environment of screen surfaces.

The art gallery and the museum have also become sites of screening experiments that resonate strongly with earlier avant-garde practices.[23] Screen-based new media practices work with the creative potential of screening by expanding the size of the screen and its capacity and by magnifying and multiplying the number of screens. Split screens, double or multiple projectors, and expanded relations between multiple screens are now fully in place. The act of screening has also incorporated other polyphonic potentials and more mobility. Virtual movement is pursued, and this also means less fixity in the conceptual configuration of the screen, which becomes the surface of a mediatic transformation. Screen space becomes conceptually lighter and more tensile, and the texture of the screen changes to incorporate fluidity. This aesthetic phenomenon that I call 'the surface tension of media' includes the creation of 'screen-membranes' and 'curtain-scrims' in the art gallery.[24] Made of translucent fabric, this contemporary screen is conceptually closer to a canvas, a sheet, a shade, or a drape. Partition, shelter, and veil, it can be a permeable material envelope, and it is habitable space. In this textural sense, then, the contemporary screen refashions the very material archaeology of the medium that I outlined earlier. Art rejoins film as a place in which to reflect on the transformative architecture of screening and on the stability and mobility of its fabrication.

To think of screening in this sense also means to recognize that there is a movement between art forms occurring on the surface of the screen. When Moholy-Nagy emphasized light as a way to texturally connect painting

the Moving Image, including a manifesto by VanDerBeek, as well as essays by Bruce Jenkins on Fluxfilms, Branden Joseph on Warhol, Federico Windhausen on Sharits, and Beatriz Colomina on the Eameses' multimedia architecture for the 1959 American National Exhibition in Moscow, which was itself a site of such mediatic experiments. See also Youngblood, *Expanded Cinema*; Iles, *Into the Light*; Shaw and Weibel, *Future Cinema*; and Walley, 'Identity Crisis', pp. 23-50.

23   For a treatment of screen-based art, see, among others, Mondloch, *Screens*; and Balsom, *Exhibiting Cinema in Contemporary Art*.

24   See in particular Chapters 3, 4, and 5 of my book *Surface*.

to photography, architecture, and film, he created experiments that find correspondence in contemporary experimentation with the surface of light as a material form of passage. This connective thread, which involves linking together the luminous material condition of viewing in the visual arts and media, is very much alive. New material relations arise today between art, architecture, fashion, design, film, and new media, in a range of practices that, in pushing the boundaries of their specific mediums, pursue new forms of materiality through the use of such materials as technologies of light. Transitive movements of the arts reside today within haptic, luminous environments of projection. In the ebb and flow of technological change, the art of projection has found new ways to hold our fascination in intermedial forms.

Luminous Opacity: Screen, Window, Wall

This contemporary refashioning of surface in the art of projection also suggests a fundamental rethinking of the architecture of wall, window, and screen as permeable membranes. In my view, this emergent screen-membrane performs as a connective tissue, turning architecture and art into pliant planes of moving images. Let me offer some concrete examples of this 'surface tension of media' in our times. To illuminate how materiality is dwelt upon as a surface condition, I will focus on the luminous use of visual technology and new media practiced in public art by Krzysztof Wodiczko. Since 1980, this Polish-born artist, who lives in New York City and Cambridge, Massachusetts, has produced more than eighty large-scale public projections on buildings, in many different countries.[25] Wodiczko uses the medium of projection to make the face and façade of architecture into a dense surface, creating a permeable site for mediated experiences of memory, history, and subjectivity. In this way, he exposes the actual architecture of projection, in material, mediatic mediation.

Wodiczko's projections sensitize us to the texture of the surface onto which the image is projected. The space onto which these images are projected is never invisible but always rendered tangible. In *The Tijuana Projection* (2001), for example, the artist animates the human body in projection against the body of building form. The face of a woman mouthing her story is projected

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25   See, among others, Wodiczko, *Critical Vehicles*; and Turowski, *Krzysztof Wodiczko*. For a sustained reading of this artist's work, see Deutsche, 'Krzysztof Wodiczko's Homeless Projections', pp. 3-48.

as if her facial skin were adhering to the spherical surface of the dome of the city's Centro Cultural. In *Hiroshima Projection* (1999), gesticulating hands are projected in close-up onto the moving surface of a river, in this way appearing to activate mnemonic flow. In this work, the moving image is carved out of the material surface of the architecture that supports it, animates it, and moves it. A form of mediation, the architectural surface acts for Wodiczko as a partition: that is, it functions as a visible screen.

Guests, an installation from 2009, makes this even more evident. Walking into the dark space of the Venice Biennale Pavilion, you thought you were seeing eight windows, scattered on three walls, and, looking up, one skylight. But the walls did not have any openings. These frames were not carved in stone. The windows are projections. They are 'screens' on which one can catch glimpses of the life of immigrants, the 'guests' of the country we are in. *If You See Something...*, from 2005, was similarly structured. The surface of these imaginary windowed architectures functions as an elaborate form of mediation, for these luminous screens provide access to the personal narratives of invisible citizens. It is significant that the migrants are never seen or heard clearly. They appear as shadows through the light, silhouettes in a digital shadow theatre. The interrelation of visibility and invisibility in society is concretely materialized here, uncovered on the nonexistent panes of glass windows that are dressed as screens.[26]

As we look closely at these walls, which act as windows, we can actually perceive them as screen surfaces.[27] In order to see, we must navigate through a surface that is visually configured as a dense, white material. A milky, textured substance appears to our senses, and, acting as a cover for the window-walls, it mediates the relationship between seer and seen. In this sense, we perceive the materiality of projection, which is digitally configured to approach screen surface. Closer to a veil or curtain than to a pane of glass, this surface is the actual visual tissue of projection. Thus it is not just the function but also the consistency of these window-walls that is closely related to the fabric of the screen. Through this textural manifestation we can perceive—envisage—the support of the image and its representational medium. The projection screens, far from being invisible, are made palpable as projective matter. And thus as we try to make out the foggy figures of the displaced people and hear their stories through muffled sound, we experience the mediatic quality of the screen as a veiled, and veiling, surface.

26   See Lajer-Burcharth, 'Borders', pp. 32-45; and Lajer-Burcharth, 'Interiors at Risk', pp. 12-21.
27   My critical reading of Wodiczko's work owes much to private and public conversations with the artist, whom I wish to thank. See in particular Bruno, 'Krzysztof Wodiczko'.

4. Krzysztof Wodiczko, *If You See Something . . .*, 2005. Four projected video images with sound, various durations. Installation view. Courtesy of the artist and Galerie Lelong, New York.

If You See Something... and *Guests* display the actual analytic material of projection, and because this surface is made physically present, it shows a peculiar quality. In these installations, screens can materially act as membranes. As the figures move in a blur, their contours come in and out of focus, becoming more consistent as they approach the limit of the screen. The effect makes the screen feel like a tissue, a permeable, thin sheet. Such a screen appears to move like a membrane that is being stretched. Wodiczko plays ironically with this permeable materiality as he shows people trying to clean the impossibly foggy substance. Rain falls often, further blurring and veiling the surface. Some visitors to the installation come up to the site of projection as if wishing the space could extend or stretch like a membrane. In turn, the migrants act as if the partition could bend or warp to create a passage, or as if it could be visually traversed, like a veil. They push their bodies up to the surface and hold up hands, pictures, and objects as if wishing to push them through a layer of tissue. In many ways, this screen is shown to be elastic, flexible, and pliant.

Surface tension occurs here. This membrane is an actual screen also in the sense that it is a partition. On this site of partition, the migrants can negotiate status and story, for this membrane-like surface acts simultaneously as a protective layer and as a wall. There is substance, which is also a form of resistance, in this material of projection. As if to rebel against their status as shadows, the migrants push up against the partition as they would against a real border. But let us not forget that the virtual architecture constructed

by Wodiczko is also a window; that is, it is the kind of architecture in which positions between inside and outside can be mediated. In this capacity as aperture, the resilient surface does not merely divide but also enables a passage, which finally becomes a potential crossing of borders. Possibilities of openings and a hope for exchange can be sited on this composite, tensile, permeable screen that acts as a membrane.

Atmospheres of Projection

Recalling the long experimental history of 'light and space' installations, this projective passage refashions the actual form of surface tension that occurs on a film screen. Coated in the material fabric of projection, this is a space of traversal that includes spectatorial projections. As a visitor to this space, one is not safely positioned on the other side of the screen but rather stands on the border, for in order to perceive, one must cross over and project oneself across the threshold. The fabric of this screen is so absorbent that it absorbs the viewer, too, in its surface tension. To look is to feel this tension, challenging who and what is outside and inside. One cannot simply stare at this surface. The tension of this tensile surface forces one to become engaged—to the point of wishing that borders might be crossed and contact might be made through the membrane, across the fabric of the screen. Not only a site of critical distance, this kind of screen is both resistant and embracing because it holds affects in its fabric. Its porous membrane enables the passage of empathy, which is itself a form of projection. In staging an epidermic form of exchange, this surface-membrane thus mediates the potential for relatedness that is inscribed in filmic projection. And so the memory of film comes to the surface in installation form, embodied in digital space.

The indexical quality of celluloid may be no longer with us, but this new pellicular membrane is just as affectively tensile. The digital can hold us in deeply articulated surface tension. Rather than flat dimensionality, a dimension of volume and depth continues to emerge from the surface of the screen in moving-image installations. This sense of material substance is conveyed not only on the screen but also in the spaces of projection. The immaterial consistency proper to both light and air permeates these aesthetic spaces. The visible is here 'a quality pregnant with a texture'.[28] The atmosphere of projection is thick. It is dense with moody, luminous particles dancing in space, imbued with an air of cloudy, permeable palpability.

28   See Merleau-Ponty, 'The Intertwining – The Kiasm', p. 136.

Projection was indeed always an environment, and it is becoming even more of an atmosphere. Screen space is a site haunted by 'the perturbations of surfaces'.[29]

To fully sense these textural matters, think again of the material history of the screen and of the surface of design in history. After all, ethereal consistency is the material base of the act of screening. As it emerged from the design of the fire-screen and the window-screen, and then turned into the exhibition space of the magic lantern and phantasmagoria, the idea of projection was in fact, historically, born out of atmospheric surfaces. The act of projection was designed to make images flare out and move, in the way Lucretius envisioned it, surfacing from the fabric of light and the density of air. Early forms of projection were furthermore a weathered kind of space, as the phantasmagoria of projection was imbued with such vaporous things as smoke and fog. Projection was also closely associated with elusive substances such as the hazy, misty quality of shades, silhouettes, and shadows, which were thought actually to materialize on screen. Later on, Moholy-Nagy dreamt of 'light visions' even in 'open spaces, and on unusual screens, such as fog, gas and clouds'.[30] It is no wonder, then, that such surfaces of material resistance and permeability, integral to the very activity of screening, would find their own digital substance in a new atmosphere of projection.[31]

In these new viewing chambers, the force of light persists along with shadow play. A place of passage and a point of contact between worlds, the screen is a real medium. It continues to mediate today, crossing the borders of media in surface tension. In the atmosphere of projection, a form of curtaining, partitioning, and partaking of space takes place, beyond medium specificity. The screen itself is reinvented as a material architecture of 'becoming'—the tensile surface that connects and mediates texturally between art forms. Far from being responsible for dematerialization, the persistence of projection in the art gallery continues to refashion mobile, communal architectures of materiality. It even reactivates the public potential of the cinematic mode of exhibition and its experience of the public sphere. And so as the shadow theatre that is cinema is reconfigured and rematerialized architecturally, and the white cube of the gallery turns luminously dark, we are returned to the absorbent, envisioning, relational fabric of projection, displayed on yet another form of screen-membrane.

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29   On the painterly significance of this expression, see Didi-Huberman, 'The Imaginary Breeze', p. 280.

30   Moholy-Nagy, cited in Huhtamo, 'The Sky is (not) the Limit', p. 342.

31   On this subject, see also Païni, 'Should We Put an End to Projection', pp. 23-48.

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2.   Knowing Not What To Believe: Digital Space and Entanglement in *Life of Pi*, *Gravity*, and *Interstellar*

William Brown

Abstract

In this essay, I argue that *Life of Pi*, *Gravity*, and *Interstellar* exemplify a cinema of entanglement. I do this by analyzing how the films' depictions of vast space are 'sublime', while also considering how these sublime moments are made using computer-generated imagery. This sublime is potentially paradoxical in that the images are computer-generated (i.e. 'fake'), while film theorists have historically considered the awe inspired by cinema to depend upon the indexicality of the (analogue) image (i.e. cinematographic images depict something real, with that reality being separate from humans). However, drawing on Immanuel Kant's 'mathematical sublime' and Gilles Deleuze's 'powers of the false', I argue how these three films stage a sense not of sublime detachment but of sublime entanglement.

Keywords: CGI, mathematical sublime, powers of the false, Life of Pi, Gravity, Interstellar

In this essay, I wish to explore the way in which *Life of Pi* (Ang Lee, USA/ Taiwan/ UK/Canada/India, 2012), *Gravity* (Alfonso Cuarón, USA/UK, 2013), and *Interstellar* (Christopher Nolan, USA/UK, 2014) all use computer-generated imagery to depict the vast expanses of space. My aim is not to explain the filmmaking technologies involved but to explore from a more theoretical perspective our engagement as viewers with such digital depictions of space. That is, I shall argue that these moments, and the narratives of each film more generally, invite viewers to question the

reality of that which they see, thus bringing about a thinking—or intellectual—engagement or interaction with the films. This is not simply a rehashing of the passive-active spectator debate as represented respectively by *Screen* theorists in the 1970s and by subsequent cognitive film theorists. That is, the type of 'thinking engagement' or 'interactivity' that I wish to suggest here is not simply that viewers make cognitive inferences about how a character got from one place to another.[1] Rather, it is that viewers are placed in a position of uncertainty regarding the reality of what they see, both in terms of not knowing where the CGI begins and ends and in terms of not knowing whether what we are seeing is 'real' within the films' diegetic worlds. This uncertainty means that the viewer is encouraged intellectually to engage/interact with the films and thus to choose what to believe is true or real—as per Gilles Deleuze's theorization of time-image cinema.[2] I shall argue that this engagement/interaction and the subsequent process of choosing what to believe is linked to the supposedly non-indexical nature of the digital imagery that pervades these films. I also contend that the way in which these films ask us to consciously engage in the process of choosing to believe what is real/true reflects on how such choosing is not something limited to our appreciation of (certain) films, but that it is a part of our real-world existence. I shall do this by making reference to the concept of 'entanglement' as devised by feminist physicist Karen Barad.[3] First, however, let us explore the nature of digital images by engaging with the established discourses surrounding the issue of indexicality.

Indexicality

It is an oft-repeated argument that the digital image does not have the indexical relationship with the world that the analogue image does. By being a direct inscription of light (or rather, of reflected light) on celluloid or polyester film stock, the analogue image functions as evidence, or proof, of what was before the camera at the time of the image's taking. The digital image, meanwhile, is composed of the 1s and 0s of the binary code that is the image's fundament and thus supposedly does not have the same direct link

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1   For pioneering work along these lines, see Bordwell, *Narration in the Fiction Film*; Branigan, *Narrative Comprehension and Film*.
2   Deleuze, *Cinema 2*.
3   Barad, *Meeting the University Halfway*.

with reality, even if it is an image taken with a digital camera (as opposed to an image composed using graphics software).

There is a large body of scholarship on this distinction, not all of which I shall be able to discuss as a result of limited space. Readers might look at work by, inter alia, Mary Ann Doane, Laura Mulvey, and D.N. Rodowick as initial considerations from within the field of film studies of the indexical in relation—even if only implicitly—to digital images.[4] To engage only with one example, Philip Rosen draws on Charles Sanders Peirce to argue that the index, or the image's referent (that which is in the image) is 'an existent whose presence is required in the formation of the sign [here, the image]'.[5] Rosen recounts how for many theorists digital images are, conversely, more like Peirce's category of the icon: the digital exists 'through pure ideals rather than impure actualities, things that will eventually be achieved, rather than an achieved state of things'.[6] For Rosen, there is an implied 'futurity' in the digital image, then, in that it does not refer back to a reality that happened and of which the analogue image functions as proof—with this idea of proof being key for understanding both André Bazin's 'ontology of the photographic image' and Roland Barthes' concept of the *punctum*.[7] Instead, being proof of nothing that has existed, of nothing that was before the camera at the time of the image's taking, the digital image asks us to relate to it in terms of a present, or a present-future fashion.[8]

Now, Rosen is not unaware of the fact that '[i]t was, after all, possible to fake photographs before digitization', a fact also discussed at some length by William J Mitchell.[9] In comparison to the analogue image, however, the digital image possesses 'infinite manipulability' since it is not tied to the real world in the same way as an analogue image is via indexicality.[10] This in turn supposedly lends to the digital image an 'interactive' quality,

4   Doane, *The Emergence of Cinematic Time*; Mulvey, *Death 24x a Second*; Rodowick, *The Virtual Life of Film*.

5   Rosen, *Change Mummified*, p. 18.

6   Ibid., p. 316.

7   Bazin, *What is Cinema?*; Barthes, *Camera Lucida*. Although Bazin's work on the 'ontology of the photographic image' discusses the direct link between the world and the image, it is perhaps important to point out that he does not use the term indexical, which was instead a concept introduced by Peter Wollen, *Signs and Meaning in the Cinema*, pp. 120-155. We might also note that Bazin's understanding of cinema is more nuanced than simply believing film to be a direct copy of the world, as Tom Gunning and Daniel Morgan have more recently explained; see Gunning, 'The World in its Own Image'; Morgan, 'Rethinking Bazin'.

8   Rosen, *Change Mummified*, p. 322.

9   Ibid., pp. 320; Mitchell, *The Reconfigured Eye*.

10   Rosen, *Change Mummified*, p. 322.

since one can literally change it or it is never fixed or finished.[11] Rosen, however, challenges this idea of interactivity on two levels. Firstly, if the digital image is freed from its direct, indexical link to the world, then the fact that so many digital images aim to look like photographs, especially in terms of their realism, indicates that there is a fixed (sense, or perception, of) reality that does underpin even the digital image and in which, therefore, we are implicitly rooted.[12] That is, the 'infinity' referenced in the term 'infinite manipulability' is somewhat small (and not infinite) if the image tends not to be manipulated beyond the already-existing conventions of cinematic representation.[13] Secondly, since the viewer cannot interact with digital images in a particularly creative fashion (instead just copying the conventions of analogue cinema), Rosen asserts that 'this means that *there has never been any such thing as interactivity*'.[14] He says this because while it is all well and good to hypothesize an interactive cinema, this interactivity remains an ideal rather than a reality. Since this interactivity only exists in the realm of the ideal, it does not exist—and never has existed—in the 'real' world.

In that he tries to bring the idealist discourse surrounding the interactivity of digital images back into the 'real' world, there is much to admire about Rosen's argument. In short, we can all dream of a digital utopia, but until disparities in technology, wealth, access, and education (among other things) are addressed and rectified—in addition to a transcendence of the all-too human capacity for both humans and human-designed machines to make mistakes (as revealed in the case of the latter by glitches)—that utopia remains simply an ideal, most likely an unworkable one.[15] Nonetheless, I shall argue that there are grounds upon which to challenge Rosen, both in terms of a more 'intellectual' interactivity that can exist between film and viewer and via a shift in understanding about the real world. Rosen himself implies the former when he says of digital images that '[o]ne can

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11   Ibid., pp. 333-334.

12   Ibid., pp. 331-332.

13   'To boldly go' is the famous split infinitive that was uttered at the beginning of every episode of *Star Trek* (Gene Roddenberry, USA, 1966-1969). To conquer space, as happened in that show (and in the films both based on that show and those under consideration here), perhaps similarly involves a 'splitting' of infinity/the infinitive. However, if space is ever conquered, it is only ever conquered at a particular moment in time, since in an ever-expanding universe, space will change from one instant to the next. What is more, if space is conquered, what remains beyond human capacity—what remains infinite—is time itself.

14   Rosen, *Change Mummified*, p. 336.

15   B. Ruby Rich has made a similar point in a recent editorial of *Film Quarterly*; see Rich, 'Film, Digitality, and Cultural Divides'. For glitches, see DeMarinis, 'Erased Dots and Rotten Dashes'.

never be certain that the image one is seeing at a specific time or point on the network has been definitively fixed or finalised', an uncertainty that does indeed ask for intellectual engagement/interaction along the lines outlined above.[16]

With regard to the latter, meanwhile, if digital images look like analogue images as a result of a fixed (sense or perception of) reality—if images that do not conform to the conventions of analogue photography are not 'realistic'—then this suggests that reality itself is fixed/stable. However, if, as I shall argue, reality itself is not fixed/stable, then it is hard to measure anything against that reality as realistic or otherwise. I shall return to the relationship between indexicality and realism later, but for the time being I wish to comment on Rosen's stated decision not to enter into a 'debate over the fit or the lack of fit between discourses of the digital and some empirical reality'.[17] That is, the framework of Rosen's investigation of the digital is not realism (although I shall suggest that an underlying conception of realism sneaks into his work) but rather the discourse that surrounds it. However, it is precisely via a discussion of an 'empirical reality' that is not fixed but that always is changing, or becoming, that I shall suggest that the intellectual interactivity I wish to describe is matched on some levels by a more profound interactivity, or entanglement, of film and viewer and world. For the concept of entanglement, after Karen Barad, suggests not that interactivity has never existed (if such a twisting of Rosen's words is permitted) but that, in terms of humans playing a role in the shaping of reality—and by extension of the films that are a part of that reality—that interactivity has always existed. In order to build this argument, let us look at how spectator responses to CGI effects have historically been theorized, starting with the concept of the sublime.

The Sublime

Life of Pi is about a man named Pi (played as an adult by Irrfan Khan), who recounts to a Canadian writer Yann Martel (Rafe Spall) an episode of his life from when he was a young man (Suraj Sharma). After his family decides to relocate with their zoo from Pondicherry, India to Canada, the Japanese cargo ship upon which they are travelling sinks, and Pi ends up stuck in a lifeboat with a Bengal tiger known as Richard Parker, a hyena,

16 Rosen, *Change Mummified*, p. 334.
17 Ibid., p.3 36.

a zebra, and an orangutan. The hyena kills the zebra and the orangutan, before in turn being killed by Richard Parker, with whom Pi establishes an uneasy coexistence. After 227 days at sea, Pi and Richard Parker hit land in Mexico (after a brief sojourn on a supposedly carnivorous and living island) and part company. Pi recounts his experiences to various insurance agents who are skeptical regarding the veracity of his story, before telling them the 'true' version of events, namely that the lifeboat in fact featured his mother, a Buddhist sailor with a broken leg and the ship's cook. The cook killed the sailor and his mother before Pi killed the cook and survived by eating him. At the end of the film, Yann says that he prefers the story with the tiger to the potentially 'true' story of murder and cannibalism.

Gravity, meanwhile, sees astronauts Stone (Sandra Bullock) and Kowalski (George Clooney) try in almost real time to get from the Hubble Space Telescope that the former is helping to service to the International Space Station (ISS), which has been abandoned by the other astronauts on it. Kowalski sacrifices himself to help Stone get into the ISS, whence she uses a Russian Soyuz craft that cannot be used for re-entering Earth's orbit (as a result of its parachute having already opened) to reach the Chinese *Tiangong* space station. As the *Tiangong* falls apart as a result of the same debris floating around Earth's orbit (apparently caused by the Russians destroying a decommissioned satellite via a missile strike), Stone gets into a capsule that guides her back to Earth, where she lands in a lake, nearly drowns, but ultimately makes it to shore as fragments of the *Tiangong* also fall from orbit.

Finally, *Interstellar* takes place in a future when the Earth can no longer sustain its population as crops die and arable land turns to desert. Astronaut-turned-farmer Cooper (Matthew McConaughey) finds Morse code map coordinates written in dust on the bedroom floor of his daughter, Murphy (Mackenzie Foy). These lead him to a NASA base where astronauts, including Brand (Anne Hathaway), are planning to travel via a wormhole to find other inhabitable planets. Cooper joins their mission and goes through the wormhole to find two uninhabitable planets. After their ship is damaged, Cooper and a robot called TARS get sucked into a black hole in order to be able to send fellow-astronaut Brand to a third planet. Inside the black hole, Cooper finds himself within a strange space (referred to as a tesseract, and which I shall describe in more detail later) created by the invisible life forms that humans will become, and from which he can see and interact with Murphy's bedroom at different moments in time. He creates the Morse code dust pattern on Murphy's floor, thereby setting his own plot in motion,

5. Still from *Life of Pi,* directed by Ang Lee, 2012. 2:07:00. Glowing marine life and reflected starlight give the sense that Pi is adrift not just at sea but in the universe—with the cosmic scale of the image pushing it in the direction of the sublime.

while also sending via other clues a mathematical formula to his daughter (played as an adult by Jessica Chastain) that will allow humans to launch space stations big enough to serve as viable biospheres alternative to Earth. Released from the black hole, Cooper joins Murphy—now an old woman (played by Ellen Burstyn)—on one of the space stations that she helped to create and which is located in the orbit of Jupiter. Murphy sends Cooper off to find Brand on the third planet.

While the films vary in terms of how convoluted their plots are, what unites *Life of Pi*, *Gravity*, and *Interstellar* is their spectacular and computer-generated depictions of space. In the first film, we see an extreme long shot of Pi and Richard Parker on their lifeboat as a multitude of stars not only shine above them in the sky but also are reflected below them in the ocean's surface—such that Pi, Richard Parker, and the boat seem to be the very nucleus of the universe. *Gravity*, meanwhile, opens with a long take that lasts more than 10 minutes as the film's plot is set in motion. Not only do we see awe-inspiring views of the heavens and Earth from space but, as the camera circles the protagonists, the Hubble telescope, and the shuttle to which it is connected, the shot in its duration and complexity encourages viewers to marvel at its technological construction. Finally, *Interstellar* features mind-bending visuals of time seeming to move in one direction ('backwards') around the black hole, while at a slightly further remove from it Cooper and Brand's spaceship, the *Endurance*, moves in the other direction ('forwards').

Rowan Wilken summarises that:

> [t]he word 'sublime' rose to prominence at the beginning of the eighteenth century in order to capture the manner in which certain beautiful, vast, or grand things—especially landscapes—affect the mind with a sense of awe, deep reverence, or lofty emotion.[18]

Perhaps it is logical, then, that the term has been taken up by film scholars to describe shots of the heavens, including digital shots of the heavens like those described above. Scott Bukatman has clearly argued, for example, that moments in science fiction cinema such as the Stargate sequence from *2001: A Space Odyssey* (Stanley Kubrick, USA/UK, 1968) or the arrival of the alien craft in *Close Encounters of the Third Kind* (Steven Spielberg, USA, 1977) can evoke a sublime response.[19]

Now, Greg Tuck has countered such claims by suggesting that digital moments designed to induce a sublime response cannot achieve as much, since digital images are quantified (as 1s and 0s), while the sublime is or should be unquantifiable.[20] However, Tuck's otherwise excellent argument perhaps overlooks the fact that Immanuel Kant, one of the earliest theorists of the sublime, describes 'the encounter with extreme magnitude or vastness' as the 'mathematical sublime'.[21] That is, one can apprehend magnitude (one can count it / it is mathematical), but one cannot *comprehend* it.[22] I would add to this that while there is space for the 'mathematical' or quantification in the sublime experience, technology also plays a key role in giving us access to such views (looking at the heavens through a telescope; digitally constructed starscapes), with technology itself being linked to the sublime in that it, too, comes to escape our understanding/comprehension, even if we can apprehend it. Indeed, for Bukatman, '[n]ature [that which used to induce the sublime] is displaced by technology', meaning that '[t]echnology permits a containment of nature'.[23]

In relation to *Interstellar*, we can literally see this when the film ends with humans living on a space station in which a cylindrical atmosphere contains a kind of miniature version of Earth, suggesting that 'the appearance of

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18   Wilken, 'Unthinkable Complexity', p. 193.
19   Bukatman, *Matters of Gravity*, pp.81-110.
20   Tuck, 'When more is less'.
21   Wilken, 'Unthinkable Complexity', p. 194.
22   Ibid., p. 195.
23   Bukatman, *Matters of Gravity*, p. 102.

nature has become little more than nostalgia for a pastoral ideal'.[24] However, what is interesting about the sublime views in *Life of Pi*, *Gravity*, and *Interstellar* is that they are tied to the idea of a world that cannot be conquered or fully controlled/displaced by technology. In *Life of Pi*, technology repeatedly malfunctions: the Japanese cargo ship sinks, and Pi's attempts to remain at a distance from Richard Parker are stymied when a whale crushes a raft that he has found and on which he keeps his supplies. In other words, nature continually crushes technology. The same is true in *Gravity*, which does not tell the story of humans conquering space but which rather tells of the smallness of humans in the face of space. Science fiction aficionados will have seen spaceships fly through debris and meteor showers in various films and television shows—but none is so inevitable and devastating as the debris that drifts towards Stone and Kowalski in *Gravity*. Furthermore, the film is really an exercise in what Sean Cubitt has termed, in relation to much contemporary cinema, 'heroic problem solving'.[25] Stone does not really do much except run through her options of survival; she is not setting out to conquer new worlds but to return to her own world—and while it is a Russian rocket (i.e. technology) that sets in motion the debris, it is the environment of space that poses the greatest threat to her. Finally, while *Interstellar* does on some level suggest that humanity via its technological prowess can contain nature on a space station orbiting Jupiter, it only does so because the one thing that humanity cannot control is nature on Earth. What is more, the first two planets that the astronauts visit on the far side of the wormhole may have a relatively stable atmosphere, but neither is inhabitable for humans. In other words, while the film may end with the somewhat muted and lonely image of Brand on a third, seemingly more hospitable planet beyond the wormhole, *Interstellar* does not tell a story of great heroism and the conquering of new/final frontiers. It is rather, as per *Gravity* and *Life of Pi*, a story of heroic problem solving—with technology allowing a small number of humans to escape Earth, although we are not told how many nor what has become of those left on the planet (presumably they have been left to die). In sum, then, it seems that technology does little to help the majority of humans, suggesting that the myth of technology as a form of liberation is, like the film's ending, muted. Paradoxically, this is conveyed in part through the smallness of man in relation to the heavens, as shown in the sublime if digital shots evoked above. By glossing over the fact that humans have not been able to save the Earth, *Interstellar* may come

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24 Ibid.
25 Cubitt, *The Cinema Effect*, p. 251.

closest to suggesting man's technologized ability to control space and even
time, but if we acknowledge man's inability to save the Earth, then all three
films can be seen as suggesting that humans are, in the end, dragged back
down to Earth by gravity. This is also suggested in *Interstellar* by the fact
that all events could be Cooper's dream, as we shall explore below.

Non-Anthropocentrism

While the films' stories suggest that humans come back down to Earth
or leave it because they cannot control it, the images that we see suggest
that cinema itself is not bounded in the same way. The 'sublime' moments
in all three films, as described above, suggest that while humans cannot
transcend themselves, cinema can—and in these instances does—transcend
humanity, thereby presenting to us a non-anthropocentric perspective.
What I am not proposing here is that movies are made by machines, even if
we must admit that movies are made with machines. Perhaps humans will
always have to be involved at some level in the making of movies. What I
am proposing, however, is that the 'sublime' moments in these films suggest
if not humanity's mastery of space, then cinema's.

It is significant that in the three key examples given above (Pi dwarfed
by the heavens, the opening shot of *Gravity*, the black hole sequence in
Interstellar), we do not see things through the eyes of any of the characters.
Compare this to the moments when we first see the dinosaurs in *Jurassic
Park* (Steven Spielberg, USA, 1993), when the T-1000 (Robert Patrick) passes
through metal bars in *Terminator 2: Judgment Day* (James Cameron, USA,
1991), and the first vista of the floating Hallelujah Mountains in *Avatar*
(James Cameroon, USA, 2009). In each of these films, the would-be sublime is
linked to the perspective of one or several characters, who also cue audience
members about how to respond to these moments via shots of their jaws
dropping. In the three films that are the focus of this essay, the characters
either cannot see what the audience sees (*Life of Pi*), or they are too busy
getting on with their work, which is surviving, in order to pay the similar
attention to them that the viewer can (*Gravity*, *Interstellar*). As a result, it is
the film, or cinema itself, that achieves the sublime via non-anthropocentric
perspectives, as opposed to via the points of view of certain characters.

Furthermore, I would add that these moments might also achieve a
greater, or at least a slightly more nuanced, sense of magnitude-and-vastness-
induced sublime, because, without a cue to tell us how to react (as happens
in *Jurassic Park*, *Terminator 2*, and *Avatar*), the viewer is invited to choose

for herself how to respond to these moments. While I shall be arguing that both an inability to tell where CGI begins and ends and a difficulty in telling dream from reality encourage an 'interactive' spectator, the fact that these films give space for the viewer to choose to marvel (rather than telling her to do so) suggests that they consciously encourage a more 'interactive' and less 'didactic' viewing position. In this way, these moments of the digital sublime take their place alongside a history of self-reflexive and other techniques, such as breaking the fourth wall and depth of field (especially in conjunction with the long take), which equally have been theorized as provoking 'active' viewers. As we shall see, these moments help, after Deleuze, to constitute a sort of digital time-image.

That the camera presents to us a non-anthropocentric perspective is made most clear in the opening shot of *Gravity*, as the camera swirls around Stone and Kowalski in a single, unbroken movement; no human can do this. Furthermore, when at the end of *Interstellar* Cooper finds himself inserted into the tesseract, he sees Murphy's room back on Earth in a space in which various moments play out on numerous 'screens' that he can peruse at will. That is, Cooper moves backwards and forwards through Murphy's life (or, more correctly, the life of her bedroom), with each moment in the room playing in what is presumably a loop on each 'screen' that the tesseract has provided for Cooper to see. The tesseract is, in other words, a metaphor for cinema, with its power deriving from its ability to offer to Cooper a non-anthropocentric perspective.[26] That Cooper is able to interact with Murphy (knocking books from her shelf, fashioning Morse code patterns in the dust using gravity and light, and leaving a watch also with a Morse code message on it) also means that the tesseract functions as a metaphor for how we also interact with cinema, even if mentally/intellectually and not necessarily physically (humans cannot in real life reach into the screen and knock books off shelves in the film world). As I shall explore in more detail below, viewers—like Cooper—do not just watch but also help to constitute and realize the film.

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26   I would like to thank the book's editors for suggesting that the tesseract functions somewhat like the space stations in *Interstellar*. For while the space stations provide spatially miniaturized and inverted Earths (humans inhabit the inside and not the surface of the station), the tesseract provides a temporally miniaturized and inverted Earth (key moments from the life of the bedroom, seen from 'inside' rather than 'on' the 'surface' of time). Continuing with the idea of the tesseract as an allegory for cinema itself, this miniaturization may well suggest a weakness of cinema: it cannot capture reality, only ever a mini version of it (as made clear by the constant limit that is the frame). Nonetheless, cinema can still offer to us different perspectives, which in turn intellectually engage us and stimulate us both to thought and to change.

Virtual Camera

The non-anthropocentric perspective that the camera can achieve suggests the power of cinema to transcend human perspective (although it is not only through the camera that cinema can accomplish this; sound can also play a key role here, even if I do not presently investigate this). However, in the case of *Gravity*, much of what we see is from the perspective not of a physical camera but of a virtual one. That is, while actors Sandra Bullock and George Clooney might have been filmed with physical cameras, those images are nonetheless interpolated into a 3D digital 'volume' about which the camera can move as it wishes, precisely because it is a camera without a physical body (it is a virtual camera). This is made especially clear when, at a later point in *Gravity*, the camera passes from inside to outside of Stone's space helmet, thus passing through solid matter as if it were thin air. Neither physical cameras nor humans can do this without smashing the helmet's glass visor (killing Stone in the process).

Since the virtual camera has no physical existence, and since many of the images of deep space that we see in all three films are computer-generated, digital visual effects (to use the term employed by Stephen Prince), it perhaps seems counter-intuitive to say that these films can achieve a sense of the sublime and that they are somehow 'interactive': we know that what we are seeing is not real and that it was created by a computer; being intangible and precisely not an index of a pre-existing and physical/material reality, there is nothing with which we can interact (even if I am focusing primarily on intellectual, or mental, interaction).[27] However, in spite of the images' lack of indexicality, and not only in spite of but also because of their 'virtual', immaterial nature, these images can present non-anthropocentric perspectives all the more powerfully.

This is apparent in the very mobility of the virtual camera, especially its ability to pass through solid matter as if it were thin air. For the fact that the camera can move through solid matter suggests that all matter, be it solid, liquid or gas, exists on a continuum—and that these states are not necessarily separate from each other but also exist on a single continuum. The unbroken continuity of the space helmet visor shot and of the opening sequence of *Gravity* suggests, then, the continuity of space and all that it contains and with which it exists, including humans. If humans are part of the continuum of space as opposed to abstracted from the world, then not only can we conclude that such virtual camera movements convey the

27   Prince, *Digital Visual Effects in Cinema*.

enworlded nature of the human but that, being enworlded, humans are not divorced from the world but thoroughly entangled and thus interacting with it.[28]

Such 'impossible' virtual camera movements reinforce the idea that digital cinema can achieve the sublime. A shot of the heavens, especially an analogue/'documentary' shot of the heavens, might be sublime. But the impossible virtual camera movements of digital cinema suggest that cinema is itself sublime rather than necessarily the contents of a particular image. This sense of the sublime is partly predicated upon a traditional sense of vastness, which is also linked to the non-anthropocentric perspectives offered by a technology that, like the vast universe itself, we may be able to apprehend but not necessarily comprehend. But more than this, our lack of comprehension suggests not an absence, an abstraction, or a departure from the world but precisely our enworlded or entangled nature. In other words, the conquest of space by the virtual camera reinforces our own sense of *not* having conquered space, of not being able to control the planet, but instead of being caught up and interacting with space.

Now, cinema has always been able to offer impossible perspectives, including impossible camera moves that take us through solid objects. As per the 'impossible' view through the wall that is the perspective of Murphy's room offered to Cooper by the makers of the tesseract in *Interstellar*, *Funny Face* (Stanley Donen, USA, 1957), for example, also features a shot from through/behind a bookshelf in the shop where Jo Stockton (Audrey Hepburn) works (the perspective is impossible because humans cannot see through walls). Furthermore, in *Citizen Kane* (Orson Welles, USA, 1941), the camera famously passes through the sign of the El Rancho bar and down, via a dissolve, through the skylight to find Susan Alexander (Dorothy Comingore) washed up and down and out. However, such shots are unusual because they are hard to achieve—with the quite visible dissolve in *Kane* making clear that the shot is specifically constructed. Furthermore, there is a long history of the impossible camera movement in animation, including animation mixed with live action. Leon Gurevitch writes, for example, about how a short film like *Down the Gasoline Trail* (Jam Handy Organization, USA, 1935) uses animated sequences that at times are layered on to still photographs of engine parts (and at other times entirely animated) in order to show us the journey of a drop of gasoline as it travels through the inside of a Chevrolet.[29] The mastery of the camera is strongly implied since it accesses

28 See also Brown, *Supercinema*, pp. 21-50.
29 Gurevitch, 'The Transforming Face of Industrial Spectacle'.

parts of the engine to which, we are told, even water cannot pass—e.g. via a photographic gauze that we see on screen, and through which the animated gasoline drop passes.

However, in the case of *Down the Gasoline Trail*, viewers can easily distinguish the animation from the live action because the animation is not photorealistic. Furthermore, much like the dissolve in *Kane*, the film in fact cuts as it approaches physical barriers like the gauze, marking the limitations of the camera. In other words, *Funny Face*, *Citizen Kane*, and *Down the Gasoline Trail* might also feature, or at least imply, impossible perspectives, but techniques like cuts and dissolves reveal their constructed nature. In *Gravity*, meanwhile, we cannot see the cuts as we pass from inside to outside of Stone's helmet, and in *Life of Pi*, *Gravity*, or *Interstellar* as well, we cannot tell where the computer-generated imagery begins and the non-animated footage ends.

Photorealism

It is at this point that the photo- and/or perspectival realism of the digital image becomes important. For while the digital image is not indexical, its realism and the seamless fashion in which it is composited with the analogue aspects of the image are important in several ways. To begin with, they are important because when our ability to clearly distinguish between the analogue and the digital is somewhat challenged, in the sense that I am not sure any longer what is 'real' and what is a digital animation, then we must choose what to believe.

To be clear, viewers tend to have a probabilistic, 'instrumentalist' approach to the images that they see; humans generally know that balrogs do not exist in the real world, and so they can be pretty certain that the balrog that they see in *Lord of the Rings: The Fellowship of the Ring* (Peter Jackson, New Zealand/USA, 2001) is a digital creation, while many of the other characters are played by humans who are not digital.[30] When I thus say that we do not know where the digital begins and ends, I am not suggesting that humans believe that the monsters and impossible events that mainstream cinema churns out actually exist or take place. However, in the case of *Life of Pi*, *Gravity*, and *Interstellar*, there is a sense in which I am called upon to make a choice regarding what I believe to be real and what I do not. As explained, Rosen objects to digital cinema as not being particularly 'infinite' in its

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30   For more on this instrumentalist approach to digital images, see Minnis, 'Digitalisation'.

manipulability nor particularly 'interactive' because the digital tries to look like the photographic. However, *pace* Rosen, it is precisely in looking like the photographic that the viewer's uncertainty, and thus intellectual engagement, is solicited in that she must choose what to believe and what not to believe. I know that the infinite space that surrounds Pi, Richard Parker, Stone, Kowalski, Cooper, and Brand is digitally created. And yet I am incapable of discerning where that digital space begins and ends, much as I can apprehend but not really comprehend how the images are constructed. In this way, I know not what to believe.

To return, as promised, to the relationship between indexicality and realism, I wish to recap how Rosen suggests that the digital has not fully escaped indexicality because of its insistent return to the perspectively realistic. And yet, as we know from the fact that a footprint, which is an index of the human who stood in its place, bears little resemblance to that human, indexicality has little or nothing to do with realism. Indeed, Rosen's charge that the digital unimaginatively pursues perspectival realism could as well be made of photography itself: why don't photographers more often use lenses, filters, film stock, shutter speeds, and so on that completely distort/manipulate 'infinitely' what they are seeing? In either case—creating a 'realistic' or a 'distorted' image—the analogue photograph would still be indexical, while the digital image would not.[31] As hinted earlier, the pursuit of photo-/perspectival realism thus has nothing to do with indexicality in the sense of the word that Rosen discusses and everything to do with the way in which perspectival realism solicits a particular response from the viewer. What is more, my suggestion here is that the response is along the lines mentioned above: to ask the viewer to choose what to believe in relation to what they are seeing. In other words, the indexical nature of the photographic image might well prove that something existed in the past, at the time of the image's taking, but it does not prove the reality of the image's content, and certainly not the veracity of any interpretation of that content. Like Cooper reaching back in time to communicate with Murphy, the digital perhaps sends a message back to analogue cinema: we never did really believe in it wholesale, just as we do not believe digital images wholesale. The sublime, photorealistic, and digital moments of these films, in which I am forced to choose what to believe (where the line between the digital and analogue is, if it exists

31   Marks, *Touch*, pp. 161-176, has posited an interesting argument regarding how electronic (and, by extension, digital) images might well be indexical, even if not in quite the same way as an analogue image.

at all), draw out the way in which I am in fact choosing to believe by interpreting, engaging intellectually, or what I am terming interacting with all images at all times. While photorealistic digital images make clear the way in which we choose what to believe, this clarification modifies our understanding of not just digital but also analogue images: we interact with them, at least on an intellectual level. Contrary to Rosen, who believes that there has never been interactivity, my argument here is that film viewing has always been 'interactive'—because we live in an entangled and hence 'interactive' universe, with cinema also being an entangled part of that universe, as I shall discuss below. First, however, I shall look at how the films' plots also reflect this interaction, above and beyond the digitally constructed images analyzed above.

Powers of the False

Life of Pi is a film that thematically engages most obviously with the issue of choosing what to believe. Faced with the more plausible story about his mother, the Buddhist sailor, the cook, and Pi killing each other on the lifeboat, both Yann and the Japanese insurers seem to choose the story about a boy on a boat with a Bengal tiger. Whether or not the characters 'truly' believe the Bengal tiger version is hard to prove; we can easily suspect that deep down Yann and the insurers 'know' that Pi's experience was one of murder and anthropophagy instead of interspecies pseudo-bonding—but they indulge his fantasy so that he does not have to properly recall his past. However, if we take the film at face value and assume that the characters truly choose to believe that Pi was on the boat with Richard Parker, then the film invites us to choose, too.

In a slightly more oblique fashion, *Gravity* might also be the product of Stone's imagination. This is made most clear when Kowalski, having sacrificed himself for her as they try to enter the ISS, reappears in the Soyuz, persuading her not to give up and to try to reach the *Tiangong*. Kowalski is evidently the figment of Stone's imagination, but he is presented to us as physically real by the film. It is not that we should believe Kowalski actually to have survived death; the issue becomes whether, if Stone can materialize Kowalski out of nowhere, how much of the rest of the film is 'in her imagination'?

Finally, *Interstellar* also might be the product of Cooper's imagination, not least after he enters the tesseract after having ostensibly been consumed by a black hole. Since not even light can exit a black hole, the power of

6. Still from *Interstellar*, directed by Christopher Nolan, 2014. 2:49:00. A tiny moon and blazes of light swirl around a black hole in *Interstellar*, creating an awe-inspiring, sublime effect on the viewer.

gravity is so strong there that all material life would be crushed down to an infinitesimal point.

The tesseract sequence could thus simply be Cooper's dying fantasy. However, the fantasy moments might have started long before. At the film's opening, we learn that Cooper is haunted by dreams of a test flight for NASA that nearly killed him; potentially he is already dead, hence the fantasy aspects of the future Earth that he is living on. This might furthermore explain why Cooper follows the dust-gravity coordinates and happens to end up in the new office of his old boss and the father of his fellow astronaut, Professor Brand (Michael Caine). Does the 'real' world involve such improbable coincidences? This might also explain how Cooper is able to leave the tesseract and be found by humans floating in space near Jupiter, before finally setting off to find the astronaut Brand: none of this is real.

There is a tradition of madness in space travel films in which it becomes hard to determine what is 'real' or otherwise. Andrei Tarkovsky's *Solaris* (USSR, 1972) is a key film in this respect (remade by Steven Soderbergh in the USA in 2002, starring George Clooney, making it a clear intertext with *Gravity*). From this perspective, the differences between the films are not especially important. What is important is that in each film—in *Life of Pi* most specifically—the viewer is again asked to choose what to believe. This 'choice' brings to mind recent work by Patricia Pisters on what she terms the 'neuro-image', a contemporary form of cinema, strongly shaped by the digital, and which by its very name implies that the plot of a film might all be in a character's head. Pisters develops a sophisticated argument concerning Gilles Deleuze's notion of 'the powers of the false', suggesting that in a film like *The Dark Knight* (Christopher Nolan, USA/UK, 2008), the citizens of Gotham choose at the film's end to believe that Batman is

evil because that is the fiction necessary for them at that time.[32] However, while the citizens of Gotham might not know as much, *The Dark Knight* does make clear to us, the viewers, that Batman is not evil but a hero. While the three films discussed here reflect in many respects Pisters' concept of the powers of the false as it works in relation to the neuro-image, they also progress beyond *The Dark Knight* and put *the viewer* in the position of having to choose what is 'true' rather than simply allegorizing as much in their narratives. Indeed, this is more in keeping with Deleuze's own meaning of the powers of the false, which is, *contra* Pisters, not about the belief in an untruth (the false as deception; Batman is evil) but something 'beyond' the true and the false, and which in particular disturbs fixed notions of the truth by exposing that the truth is contingent.[33] That is, the truth is not fixed but changes, with that into which it changes being that which does not yet exist, i.e. the false. In a universe of becoming, the false is thus a crucial power. And in a universe with no fixed truth, to acknowledge consciously that one knows not what to believe but must therefore consciously choose what to believe (as opposed to unthinkingly accept what one is told as true) is to recognize one's interaction with the universe as a result of our entanglement with it.

Entanglement

Karen Barad has powerfully argued that humans are 'entangled' in the universe. Drawing upon work by Niels Bohr and others (which I do not have space to explain in greater length here), Barad invites readers fully to engage with what it means to be *a part of the nature that we seek to understand*.[34] To quote Barad more fully:

> [H]umans do not merely assemble different apparatuses for satisfying particular knowledge projects; humans are part of the configuration or ongoing reconfiguring of the world—that is, they/we too are phenomena. In other words, humans (like other parts of nature) are *of* the world, not *in* the world, and surely not outside of it looking in. Humans are intra-actively (re)constituted as part of the world's becoming.[35]

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32 Deleuze, *Cinema 2*, pp. 125-155; Pisters, *The Neuro-Image*, p. 94.
33 Ibid., p. 275.
34 Barad, *Meeting the University Halfway*, p. 67.
35 Ibid., p. 206.

The important point to note here is Barad's emphasis on change, or becoming: the world is consistently reconfiguring itself, and we are a part of that process, since we are of—or, perhaps better, *with*—the world.[36]

I have thus far confined the interaction of viewers with films to an 'intellectual' level, made clear in *Life of Pi*, *Gravity*, and *Interstellar* by images in which we cannot tell the computer-generated from the real and by plots that could all be in the imagination of the lead character. However, we can perhaps posit a deeper interaction via entanglement. If, as mentioned, Rosen did not want to enter into a 'debate over the fit or the lack of fit between discourses of the digital and some empirical reality', we nonetheless can by suggesting that the instability regarding the images and plots of these films reflects the instability of 'empirical' reality itself in a universe defined by becoming. The notion of an 'empirical reality' that one can observe in a detached and impartial manner is not supported by the very scientific investigations that sought to investigate such an empirical reality in the first place. That is, if humans are 'entangled' with nature, such that we and it are constantly reconstituting each other at any given moment in time, then we are, *contra* Rosen, always interacting with reality—or, in Barad's terms, 'intra-acting' with it.[37] Furthermore, if reality is not fixed in its being (or rather, if it has no 'being', since reality is only becoming), then determining what 'is' becomes an active choice that one undertakes at each and every moment of our existence, and not just when we watch films. In other words, we are constantly choosing what to believe. With regard to these films, they may make clear this process through their digital imagery and ambiguous plots; but this only points to the more general process of the entanglement of film and viewer such that the viewer and the film, like the human and the universe, mutually interact, thus constantly reconstituting each other, too.

Both *Life of Pi* and *Gravity* feature beach-landing moments, involving hand and footprints being left in the sand—an image that in each film reminds us of the index and of how the index is evidence of our interactive engagement with the world, changing it (leaving a footprint) as it sustains us. In *Gravity*, it is as if Stone chooses to believe in Earth after seeing the magnitude of space, her own insignificance, and yet her own continuity with—rather than separation from—the universe, as signaled by the opening, unbroken tracking shot. *Life of Pi* seems to offer a similar narrative, although in choosing to believe in Richard Parker rather than murder, one wonders whether the film endorses outright untruths as 'the truth' over

36 See Brown, *Supercinema*, p. 148.
37 Barad, *Meeting the University Halfway*, p. 33.

the more sophisticated 'meta'-notion that there is no such thing as truth (the power of the false).

All 'accepted truths' can be doubted, since they are constructed, chosen, and transitory in a universe with which we are entangled and which is constantly changing. George Monbiot suggests that *Interstellar* speaks of humanity's preference for science fiction fantasies of planetary escape over taking responsibility for our environment.[38] In other words, the film ultimately suggests not entanglement but fantastical escapism. However, the tesseract and the film's mind-bending digital special effects shots also suggest entanglement—perhaps in spite of the film's otherwise anthropo-centric fantasy of conquest, just as the image of the infinite universe and the uncertain narrative in *Life of Pi* also suggest entanglement, in spite of the choice to believe in Richard Parker. Sublime digital images might not be indexical, but they remind us of our entangled nature with the universe, a universe with which we are constantly changing and in which we choose to believe—not in the sense of choosing this or that thing (likely an untruth) as what to believe, but in the sense of choice being an ongoing process, precisely because of our entangled, interactive relationship with reality, which itself is not fixed or stable but always becoming.

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38   Monbiot, *Interstellar*.

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3. Digital 3D, Parallax Effects, and the Construction of Film Space in *Tangled 3D* and *Cave of Forgotten Dreams 3D*

Kristen Whissel

Abstract

This essay analyzes how parallax effects in *Cave of Forgotten Dreams 3D* (2010) and *Tangled 3D* (2010) effectively blur the boundaries between the past and present, sight and touch, and diegetic space and the space of reception in order to give form to themes concerning the dimensionality of the moving image. I show how these films function as ideal case studies for demonstrating digital 3D's transformation of film space by organizing seeing, knowing, and feeling along the screen's z-axis.

Keywords: Digital 3D, parallax effects, affect, haptics, uncanny

Since the release of *Chicken Little 3D* (Mark Dindal) in 2005, digital 3D cinema has had the odd historical status of being a 'new' medium that has returned to us from the past as a harbinger of cinema's future. To be sure, digital 3D has transformed our understanding of the (pre-)history of the cinema itself, which now must include Charles Wheatstone's invention of the stereoscope (1838) and Charles Babbage's invention of the Analytical Engine (1837) in the first half of the 19th century. However long this history, the return of stereoscopic 3D as a *digital* medium demands a rethinking of film history to include the changing dimensionality of the moving image and, with it, transformations in the articulation of film space. Much as digital tools provide new means for organizing the image along and around the x- (horizontal) and y- (vertical) axes, they have also provided, as Stephen Prince has argued, new means for 'choreographing' story, character, and action along the z-axis—a continuum that stretches from the extreme

depths of the 3D image outward into the space of reception.[1] In the process of expanding film space through the enhanced parallax effects afforded by computational imaging, digital 3D cinema also foregrounds (often quite literally) what Scott Richmond describes as 'the profound interrelation between the modulation of embodied perception and the cinema's existence as a technological system'.[2]

The use of negative parallax to create emergence effects in 3D cinema has long been associated with a playful and sensational assault on vision, whereby objects propelled across the threshold of the screen provoke shock or surprise—as in the famous paddle-ball sequence in *House of Wax* (André de Toth, 1953) or the emergent claw of the eponymous monster in *Creature from the Black Lagoon* (Jack Arnold, 1954). While negative parallax is still used in this way (particularly in 3D comedies and horror), digital technologies make possible the use of negative parallax to gently 'float' computer-generated objects across the screen, allowing the emergent image to address the spectator in an entirely different temporal and affective register. As Ariel Rogers and Barbara Klinger argue in their respective analyses of positive parallax and the debates surrounding it, emergent, floating digital 3D images are often ephemeral 'objects' (snowflakes, dust motes, ashes, bubbles, tears) that appear to have the capacity to hover in, or gently glide through, the space of reception—imparting, at times, 'a kind of lyricism and awe'.[3]

While negative parallax can generate the illusory sense of an object's presence within the space of exhibition to expand the dimensionality of the moving image and film space, digitally enhanced depth effects (positive parallax) have been central to the intensification of the immersive aesthetic that has been associated with the stereoscopic 3D image since the 19th century. When accompanied by digital surround sound and projected onto IMAX screens, digital 3D depth effects can produce an enhanced sense of immersion or presence within a radically expanded pictorial space (such the vast CG orbital space of *Gravity 3D* or sublime CG expanses of the Pacific Ocean in *Life of Pi 3D*) or within a restricted, closed, 'impossible', or otherwise inaccessible space, which, Rogers notes, digital 3D films seem inclined to investigate and/or portray.[4] As one might expect, the newly expansive spaces constructed by digital 3D have given rise to films organized formally, narratively, and thematically around the 'problem' of

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1   Prince, *Digital Visual Effects*, pp. 201-202.
2   Richmond, *Cinema's Bodily Illusions*, p. 6.
3   Rogers, *Cinematic Appeals*, p. 214; Klinger, 'Beyond Cheap Thrills', p. 191.
4   Rogers, *Cinematic Appeals*, p. 188.

overcoming or transcending increasingly expansive (spatial, temporal, historical) distances—a problem that digital 3D cinema is particularly well suited to address.

As I have argued elsewhere (2016), positive and negative parallax engage contemporary audiences with newly spatialized forms of seeing, knowing, and feeling through their promotion of epistemic and affective seeing—and I will expand this argument here to address digital 3D's expansive film space.[5] The epistemic seeing promoted by positive parallax is defined by the desire to see and know that which has been withheld from perception, and it is characterized by the imperative to move into spatial depths optically and/or physically in order to satisfy curiosity.[6] And while curiosity has its affective charge (an urgency or sensation that can be satisfied or quelled by seeing and knowing—and here Tom Gunning's [1994] formulation of the term 'epistemania' is helpful), it is associated with reason and the desire to investigate.[7] Even as stereoscopic 3D images provoke and satisfy a (perhaps urgent) need to know, the depth effects produced by positive parallax are also used to dramatize the problem of overcoming distance and to establish the *limits* of perception and the knowable; as such, positive parallax is easily harnessed to the production of intellectual uncertainty or doubt and a failure to see.

Through its emergence effects, negative parallax promotes affective seeing, a perceptual experience that underscores the embodied binocularity of vision (particularly when objects are propelled toward the spectator). Digital emergence effects are calculated to enchant the senses and to provoke a range of somatically and emotionally charged responses, thanks in part to the exaggerated relief and solidity that stereoscopic 3D gives to foregrounded objects. As Jonathan Crary explains, the persuasive solidity of the stereoscopic 3D image effaces the difference between vision and touch by offering up 'immediate, apparent tangibility [...] as a purely visual experience'—an effect that has been associated with the stereoscopic image since the popularization of the stereoscope in the 19th century.[8]

5   Whissel, 'Parallax Effects'.
6   I borrow the wonderfully fungible term 'epistemic seeing' from Martin Seel, Aesthetics of Appearing, p. 179, who associates epistemic seeing with the ability to 'see something as something' as opposed to 'the mere seeing of something'. I re-purpose this term here, changing the definition of 'epistemic seeing' in order to make it into a useful critical tool for coming to terms with the forms of visuality and vision promoted by positive parallax. See also Seel in Elsaesser, 'The "Return" of 3-D', pp. 235-236.
7   Gunning, 'The Horror of Opacity'.
8   Crary, *Techniques of the Observer*, p. 124.

While an object propelled toward the spectator can make one flinch in shock or surprise, CG objects that float into exhibition space emerge in order to provoke tears, wonder, or hesitation as the persuasive sense of the object's immediacy and 'presence' prompts us to reach out and test the boundaries between reason and the senses, knowledge and belief that the stereoscopic 3D image so playfully undermines. Floating CG objects seem to offer themselves up (however fleetingly) for our 'ocular possession' in a way that emphasizes the pleasurable effects of the imbrication of embodied vision with digital technologies.[9] In either case, negative parallax has the effect of expanding diegetic space into the space of reception and conjures up the fleeting illusion that one might reach across material and spatio-temporal divides to forge a tangible connection to the 3D image—and vice versa. Because negative parallax blurs boundaries separating diegetic space and the space of reception, it is an ideal visual effect for elaborating and emblematizing the dissolution or violation of other boundaries (such as those that separate the past from the present, presence from absence, material and immaterial, inside and outside) at the level of form, narrative, and theme.

To be sure, positive and negative parallax should not be opposed to one another as scholarly discussions of 3D cinema so often do in order to privilege depth effects over emergence effects.[10] Rather, parallax effects and the epistemic and affective seeing they promote are elaborated along the continuum of the z-axis and function in tandem, whether an object is propelled back and forth from the depths of the image out into the space of exhibition (as in the paddle ball sequence from *House of Wax*) or when depth is transformed by shallow focus into a blurred background to enhance the illusion of emergence (as in the floating tear sequence in *Gravity*), thereby yielding to negative parallax.

As Ariel Rogers explains in her detailed analysis of *Creature from the Black Lagoon*, the 'tactile' (or, in Miriam Ross' words, the 'hyperhaptic') quality of the stereoscopic 3D image has long been a defining feature of 3D's modes of address and aesthetics.[11] Both Oliver Wendell Holmes' 19th-century writings on the stereoscope (1864) and Laura U. Marks' recent theorization of intercultural cinema (2000) investigate the 'haptic' qualities of various forms of visual culture and the embodied modes of spectatorship they

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9   Ibid., p. 127.
10   See in particular Paul, 'The Aesthetics of Emergence; Higgins 3D in Depth; and Sandifer, 'Out of the Screen and Into the Theatre'.
11   Rogers, *Cinematic Appeals*, pp. 202-210; Ross, 'The 3-D Aesthetic', pp. 381-397.

promote.[12] In the process, both engage with questions concerning proximity and distance, presence and absence, seeing and feeling in ways that provide insight into the epistemic and affective modes of seeing activated by the expanded dimensionality of digital 3D cinema.

In his well-known writings published in *The Atlantic*, Holmes (inventor of the Holmes stereoscope, a handheld device mass produced in the 19th century) describes the persuasive illusion of solidity and tangibility that the stereoscope gives to depicted objects. He explains that 'All pictures in which perspective and light and shade are properly managed have more or less the effect of solidity' but that with the stereoscope, 'that effect is so heightened as to produce an appearance of reality which cheats the senses with its seeming truth'.[13] This 'heightened' sense of solidity, Holmes explains to readers, derives from the stereoscope's reproduction of 'retinal disparity' or interaxial distance, which causes each eye to see an object from two slightly different perspectives. Objects depicted through stereoscopic 3D are given more or less relief, solidity, and tangibility depending upon the angle of convergence (also known as 'interaxial convergence'), which is greater when we focus on objects closer to our eyes and increasingly parallel as we focus on more distant objects.[14] When explaining the optical principles of retinal disparity and interaxial convergence to his readers, Holmes resorts to the metaphors of clasping and touch. When we look at an object with both eyes, Holmes explains, 'the two eyes see different pictures of the same thing [...] By means of these two different views of an object, the mind, as it were feels round it and gets an idea of its solidity. We clasp an object with our eyes, as with our arms, or with our hands, or with our thumb and finger. And then we know it to be something more than a surface'.[15] Here Holmes uses the metaphors of clasping arms, hands, or a forefinger and thumb in order to foreground the binocular, embodied nature of vision. He sustains the metaphor of touch as he describes the perceptual experience of the stereoscopic view in relation to parallax effects, linking the exaggerated depth and emergence effects respectively to epistemic and affective modes of seeing:

> The first effect of looking at a good photograph through the stereoscope
> is a surprise such as no painting ever produced. The mind feels its way

12   Holmes, 'The Stereoscope and the Stereograph'; Marks, *The Skin of the Film*.
13   Holmes, 'The Stereoscope and the Stereograph', p. 140.
14   See Crary, *Techniques of the Observer*, pp. 119-120.
15   Holmes, 'The Stereoscope and the Stereograph', p. 142.

into the very depths of the picture. The scraggy branches of a tree in the foreground run out at us as if they would scratch our eyes out. The elbow of a figure stands forth so as to make us almost uncomfortable. Then there is such a frightful amount of detail, that we have the same sense of infinite complexity which Nature gives us.[16]

Holmes links looking into exaggerated depths to the mind and, in turn, the mind to touch when he claims that the 'mind *feels* its way into the very depths' of the stereoscopic image, suggesting that positive parallax provokes a look linked to a mode of curiosity (or a desire to see and know) that is inseparable from a sense of tactility or touch. In turn, negative parallax provokes a more pronounced somatic response tied to sensation, embodied perception, and affect (here, potential fright and unease).

Laura U. Marks' theorization of the 'haptic' visuality promoted by the aesthetic qualities of intercultural film and video is helpful here.[17] While neither of the films I discuss here fits neatly within Marks' rubric of inter-cultural cinema, her engagement with Alois Riegl's categories of the 'haptic image' and the 'optical image' provides a helpful comparison to the illusory tangibility of the digital 3D image and the modes of seeing that the latter promotes. For Marks, haptic visuality depends upon embodied spectatorship and proximity; haptic vision 'tends to move over the surface of its object rather than to plunge into illusionistic depth, not to distinguish form so much as to discern texture'.[18] This is partly applicable to 3D's affective seeing, which encourages the viewer to scan the surfaces of foregrounded objects presented in a degree of detail that emphasizes texture; however, affective seeing is bound up with stereoscopic 3D's tendency not only to distinguish but to emphasize the form of emergent 3D objects that emerge or bulge past the surface of the screen and exaggerate the 3D tangibility described by Holmes and Crary. CG objects that appear to float out into the space of exhibition encourage us to reach out to 'touch' the emergent image, to engage in the play between knowledge and belief provoked by its persuasive tangibility, seeming materiality, and hallucinatory 'presence'. In some digital 3D films (such as *Cave of Forgotten Dreams 3D*, analyzed below), such 'haptic visuality' encourages the spectator briefly to 'contemplate the image itself instead of being pulled into the narrative', while in others, emergent images are emblematic of a film's overarching narrative and thematic concerns and

16 Ibid., p. 148.
17 Marks, *The Skin of the Film*.
18 Ibid., p. 162.

are inseparable from them.[19] And while Marks finds Riegl's association of the haptic image with 'a sharpness that provoked a sense of touch' less useful for her discussion of intercultural film and video, I would retain 'sharpness' as a potentially significant (and well-known) feature of the emergent 3D image (evident in Holmes' description of the foregrounded branch that threatens to 'scratch our eyes out') and its ability to provoke the awareness of embodied vision that is so central to affective seeing.

Though Marks finds Riegl's category of 'optical visuality' less useful for her analysis of intercultural film, her analysis of it is helpful here because it describes a mode of perception that emphasizes the separation of the subject of vision from the object or space viewed. Marks explains that optical visuality uses depth effects to draw the eye into illusionistic space and to impose the distance that is necessary for positioning the viewer as an 'all perceiving subject'.[20] These qualities are germane to 3D cinema's epistemic seeing, its association with optical movement into exaggerated depths, and its promotion of the desire to see and know. In the films under consideration here, distance and depth provoke curiosity about an enigmatic object or spectacle held in the distance; depth, distance, and the separation of observer from observed prompts a movement (of the [virtual] camera, of characters, of the spectator's vision) along the z-axis so that the obscured object can be brought within 'reach' or so that the viewer can enjoy a credible sensation of immersion within the previously distant spectacle. However, it is important to keep in mind that distance and exaggerated depth are often staged to demonstrate the *limits* of vision, visibility, and knowability and that proximity to the sought-after spectacle often entails surrendering to (rather than mastering) the pleasurable immersive and affective qualities of the latter. Finally, much as Marks insists that haptic and optic visuality are not opposed to one another and that their differences are 'a matter of degree', I argue that digital 3D cinema's (medium- and format-specific) epistemic and affective modes of seeing are arranged on the continuum of the z-axis and engage the spectator 'in a dialectical movement from far to near', sometimes in the same shot.[21]

Two films function as ideal case studies for demonstrating the degree to which the expanded dimensionality of digital 3D space elaborates seeing, knowing, and feeling along the z-axis: Werner Herzog's essay film *Cave of Forgotten Dreams 3D* (2010) and the animated feature *Tangled 3D* (Nathan

19   Ibid., p. 163.
20   Ibid., p. 31.
21   Ibid., p. 163.

Greno and Byron Howard, 2010), both released the year after *Avatar* helped push digital 3D projection toward becoming an industry standard. These two films may at first seem to make an unlikely pairing: while the global blockbuster *Tangled 3D* is a digitally animated Disney musical aimed at children and their families, *Cave* is a documentary film shot on location and intended for audiences at international film festivals and independent/ art house cinemas. However, considering these films alongside one another permits a comparative analysis of digital 3D's transformation of film space across genres, styles, and modes of address, in the process allowing for some fairly generalizable claims to be made about digital parallax effects and the spatialization of seeing, knowing, and feeling along the expanded z-axis. Moreover, despite the salient differences between these films, they share some thematic concerns around the dimensionality of the (moving) image and take up 3D's affinity for violating or dissolving boundaries as they investigate the relationship between the past and present, sight and touch, inside and outside, diegetic space and the space of reception.

Tangled 3D: Immersive Space, Affective Seeing, and Floating CG Objects

Tangled 3D adapts the Brothers Grimm fairy tale 'Rapunzel' and transforms it into an allegory of the historical transformation of the dimensionality of still and moving image. It is not surprising, then, that the film is organized around themes concerning the renewal and revitalization of the old, the transcendence of distance, and the epistemological and affective pleasures of (re)union. Rapunzel's long hair precipitates the narrative crisis: when activated by an incantation ('make the clock reverse [...] change the fates' design'/ 'save what has been lost/bring back what once was mine'), it glows brightly with a yellow light that can heal the injured and restore youth to the old. To exploit this power, an old witch, Mother Gothel, kidnaps Rapunzel on her first birthday and, pretending to be her mother, imprisons her in a hidden tower. Rapunzel might have remained in the tower but for a distant-but-alluring nighttime light display that appears each year on her birthday, visible only at a distance through a tower window. On her eighteenth birthday, Rapunzel tricks Gothel into leaving the tower for a few days so that she can escape to see the enigmatic light display that provokes her curiosity. Before she can leave, the tower is accidentally discovered by Eugene (a thief on the run), and she persuades him to take her to see the floating lights—a movement into deep space that yields an affectively

charged, immersive spectacle organized around exaggerated depth effects and emergent, floating CG objects.

Throughout, the film compares its own digital 3D images with flattened and 2D forms of pictorial representation. The perceptual experience afforded by digital 3D is taken up as a thematic concern as the film defines its protagonist's existence, in part, through the surfaces, boundaries, and frames that separate her from the visible world outside and hold the latter at a distance. These boundaries (walls Rapunzel uses as canvases for her paintings) and frames (windows and elements of the tower's decor) are linked to two-dimensional forms of representation that underscore their function in separating the observer from the observed. Circular in shape and illuminated in part by a central skylight, the tower evokes a painted panorama, and Rapunzel covers every inch of the walls with brightly coloured images and scenes. Unlike 19th-century painted panoramas, however, these lack the detail and perspective that, Alison Griffiths has shown, allowed the painted panorama to create an immersive perceptual experience so persuasive as to cause 'shivers down your spine'.[22] Only the concave shape of the tower walls and Rapunzel's efforts to create depth through scale provide any sense of dimensionality in the images, which ultimately seem flattened and cartoonish, contrasting sharply with the detail, relief, and illusory tangibility that digital 3D gives to other objects in the *mise en scène*. This is particularly true of Rapunzel's hair, which is both absurdly long and represented with a degree of realism and detail that is nearly uncanny. In some shots, swaths of her hair criss-cross visible space from mid-field to the background of the image creating depth of field; in others, Rapunzel uses her hair to swing from the rafters, rounding out volumetric 3D space with kinetic movement. As a result, the flatness of Rapunzel's paintings of the visible world contrasts sharply with the film's articulation of the space of the tower in stereoscopic depth. Although digital 3D ensures that the audience's experience of the tower will be defined by enhanced perception and sensory plenitude, the 'flat' paintings on the walls define existence within the space as one of diminished sensory experience: while Rapunzel is imprisoned in the tower, we are temporarily and pleasurably immersed within it; while she perceives the rest of the film's fictional world at a distance and through the frame of a window, the spectator perceives such space through a medium that consistently transcends the frame and screen and exploits the affordances of digital 3D to collapse the difference between foreground and background, inside and outside.

22 Griffiths, *Shivers Down Your Spine*.

Throughout its first act, *Tangled 3D* foregrounds the historically variable function of the screen as a surface, container, barrier, and window. The tower sits in a small meadow ringed by the sheer, gray cliff walls that wrap around the circular shape of the tower. A curtain of ivy veils over the only opening that leads to the tower, making the outside world beyond it visible only as shadows projected on its surface. Early in the film, Eugene, fleeing from the King's guard, falls through the ivy curtain by mistake and hides behind it. As he watches to see if he will be discovered, sunlight projects the silhouette of a horse against the ivy as it passes by, turning the ivy into a screen that keeps moving image history—and digital 3D's place within it—in view. While the silhouette recalls the first means for projecting figural representations against a surface (an originary image that *Cave of Forgotten Dreams* also references), the horse alludes, perhaps, to the shadowy, inaugural image of Eadweard Muybridge's motion studies. At the same time, the colour of the ivy screen evokes contemporary green-screen technologies used for compositing live-action elements with CG images. This layered reference to the history of the screen, its (in)visibility, and its function here as a barrier that can (or must) eventually be transcended extends to a shot in the film's first musical number, when Rapunzel paints a picture of the floating lights on the blank space of a wall. As she covers the wall with dark blue paint for the night sky, a reverse angle shows paint covering the entire surface of the screen, making visible its status as a material surface that separates diegetic space and the space of reception (of course, the scene in which Rapunzel sees the lantern display in person constitutes the film's first and most extensive use of negative parallax). Rapunzel's bid to escape the confines of the tower is simultaneously a flight from an existence and a perceptual experience defined by the containment of the image, distant observation, and limited perception.

In *Tangled 3D*, the spectacle held in the farthest depths of the 3D image acts as an incitement to epistemic seeing and provokes a cinematic drive to minimize frames, eliminate barriers, and collapse the distance between observer and observed. Begging Mother Gothel to allow her to travel to see the floating lights on her 18th birthday, Rapunzel explains, 'I can't help but feel that they're meant for me. I need to see them, Mother, and not just from my window—in person. I *have to know* what they are' (emphasis added). Epistemic seeing incites inquiry and curiosity, precipitating a movement into depth along the z-axis; this movement not only brings the spectator closer to the spectacle but ultimately yields an immersive perceptual experience of the display defined by astonishing, affectively charged emergence effects, as the lanterns glide along the continuum of the z-axis into the space of reception.

As the lantern sequences makes clear, epistemic and affective seeing exist together along this continuum, which keeps them in play throughout. To be sure, the CG objects that digital 3D floats across the screen are often charged with significance that is inseparable from the desire to bridge distance, to overcome separation or loss, giving the seemingly tangible object an additional emotional charge.[23] Although the lanterns' true significance for Rapunzel (that she is the lost princess and that they are released to bring her home) is not revealed to her until the film's end, the long-awaited moment of finally seeing what the lanterns *are* constitutes a spectacular revelation that codes the lanterns with a range of affects linked to family melodrama, the romance plot, and the history of 3D cinema.

As the lantern sequence makes clear, floating CG objects foreground embodied perception and the binocularity of vision by generating a perceptual experience that blurs the boundaries separating (hallucinatory) presence and (actual) absence, producing a liminal zone of display that does not seem to belong entirely to either diegetic space or the space of reception. This, in turn, corresponds to the status of the emergent 3D image as 'a conjuration' produced by the imbrication of the spectator's embodied vision with 3D technology.[24] Moreover, *Tangled 3D*'s emergent lanterns give insight into how digital 3D extends diegetic space into the space of reception through virtual camera movement and parallax effects, in the process promoting a mode of affective seeing linked to sensation and emotion that goes well beyond the satisfaction of curiosity. The sequence begins by rehearsing the shift from a flattened 2D image to the (exaggerated) spatial depth and volumetric space of digital 3D. It begins with a shot of the royal lantern waiting to be launched by the King and Queen. Once it is set aloft, the camera tracks the lantern from above as it floats over the town and its harbor. The overhead shot effectively flattens the image as it tracks the mass illumination of thousands of lanterns along a winding path towards the water in a design that evokes the curved flowing pattern of Rapunzel's glowing hair, serving as a reminder that the ensuing spectacle has been calculated to convert her absence into presence by overcoming the distance that separates her from the King and Queen. Sitting in a boat just beyond the harbor, Rapunzel sees the lantern as a tiny point of light reflected against the glassy surface of the

23   In his discussion of 3D's immersive aesthetics and the strategies used by effects artists to create 'an emotional language for stereoscopic space', Stephen Prince (*Digital Visual Effects*, p. 213) explains that one artist, Robert Neumann, 'reasoned that characters and events playing in negative parallax space (in front of the screen) would convey greater emotional connection and involvement than when these were located at the screen plane or behind the screen'.

24   Crary, *Techniques of the Observer*, p. 122.

water. As the lantern rises against the night sky, Rapunzel looks up and it is doubled as it is reflected in each of her irises—a detail that initiates the shift to a rather self-reflexive deployment of parallax effects emphasizing digital 3D's reliance on retinal disparity.

Throughout the scene, the virtual camera simulates a circular movement that produces both depth and rounded volumetric space, in the process emphasizing the immersive quality of the digital 3D image. The sequence makes use of the water as a reflective surface to create a mirror image of the lights floating above, in the process producing astonishing immersive effects. As hundreds of lanterns arrayed in depth float upward and drift on a lateral trajectory, they produce a reflection that appears to move along a downward trajectory (and vice versa); in turn, lanterns drifting outward along the z-axis produce soft, rounded volumetric space. As a result, the screen on which the digital 3D image is projected appears to disappear, as does the (previously visible) horizon line. The boat—surrounded by lights on all sides—seems to float in the air among the lanterns, creating the illusion of an unframed and immersive optical field of stunning depth, volume, and glowing luminosity.

This sequence gives form to the narrative theme of escaping the limits imposed upon perception, as it 'aims at perceptually removing the presence of the frame' and overcoming distance, placing it squarely within the 'neo-baroque aesthetic' that Angela Ndalianis theorizes in relation to contemporary cinematic and amusement park spectacles, particularly as it permits 'a greater flow' of elements of the mise en scène 'between inside and outside' of the depicted diegetic space.[25] Exaggerated emergence effects allow two lanterns released by Eugene and Rapunzel to transcend the frame and float past the surface of the screen. As the two lanterns glide into the space of reception, the depth of field becomes shallow, enhancing the illusion of their presence, solidity, and tangibility. The lanterns' vivid and sustained 'presence' provokes wonder, tempting the spectator to test his or her senses by reaching out to 'touch' the CG object. Such emergence effects foreground affective seeing's conflation of sight with touch that is the hallmark of the 'haptic visuality' theorized by Marks and is central to our experience of the 'immediate, apparent tangibility' of the floating digital 3D image as 'a purely visual experience'.[26] Moreover, the emergent lanterns' association with romantic coupling gives them an emotional valence, allowing negative parallax to function as 'an affective device' that

25   Ndalianis, 'Architectures of the Senses', pp. 359-360.
26   Crary, *Techniques of the Observer*, pp. 123-124.

has 'textual functions'.[27] Even more important for the purposes of this essay, the emergent lanterns refer to (and participate in) another narrative of disappearance and return, separation and reunion, that serves as the broader film historical context in which *Tangled 3D* was produced and released: the spectacular and historically significant 'return' of stereoscopic 3D to the cinema and, with it, the 'reunion' of the spectator with the persuasively tangible, seemingly present, emergent object in digital 3D's expanded film space.

Significantly, as the two lanterns hover in front of the spectator, they revolve around one another before drifting back into the mass of lanterns as the camera circles around them. While the paired lanterns sustain the sequence's allusion to 3D's doubled image and the retinal disparity that makes stereoscopic 3D possible, their rotation imitates the switching of right-eye and left-eye images upon which emergence effects rely. At the same time, the revolving motion traces out the rounded, volumetric space that digitally enhanced negative parallax carves out in front of the screen in order to create a sense of immersion within the spectacular display. Moments after the lanterns drift back across the screen and out of view, the lantern set aloft by the King drifts toward the boat; Rapunzel reaches out and touches it, launching it upward and sending it across the screen into the space of reception. This gesture not only mimics the spectator's own impulse to reach out and touch the floating lantern but creates a relay in digital 3D's affective seeing, as the lantern intended for Rapunzel is set aloft first by the King and then, upon reaching her, is again set aloft by Rapunzel for the spectator, expanding film space beyond the frame while overcoming 'distance' and 'separation' through emergent elements of the mise en scène that not only emblematize but enact a series of reunions, as the lanterns float from the castle to the boat to the space of reception. With this in mind, it is important to note that the single lantern launched by the King frames the heterosexual union (represented by the paired lanterns) as a subplot within a much longer family melodrama of separation, reunion, and restoration that allegorizes the disappearance and spectacular return of stereoscopic 3D from the realm of visual culture.

With this in mind, it makes sense that this sequence exploits digital 3D to create the illusion of presence and immersion within expansive diegetic space by producing an intense perceptual experience that includes hearing as well as vision and touch. The lyrics to the song, 'At Last I See the Light', conflate the film's historical narrative with the romance plot and underscore

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27   Klinger, 'Beyond Cheap Thrills', p. 189.

the sequence's status as a technologically enhanced spectacle that links optics to affect and the luminosity and clarity of the digital 3D image to visual pleasure and emotional epiphany. The lyrics are worth quoting for the way they articulate the film's overarching concern with knowledge, affect, and perceptual fields:

> All those days, watching from the windows
> All those years, outside, looking in
> All that time never even knowing just how blind I've been
> Now I'm here, blinking in the starlight
> Now I'm here, suddenly I see
> [...]
> And at last I see the light
> And it's like the fog has lifted
> And at last I see the light
> And it's like the sky is new
> And it's warm and real and bright
> And the world has somehow shifted
> All at once everything looks different,
> Now that I see you.

These lyrics narrate a historical shift away from a mode of spectatorship in which the observer, looking through a window, was positioned 'outside' the spectacle—a placement the song associates with distance, diminished perception, and even a failure to see. The song defines the spectacle of the floating lanterns as one that produces and initiates a historically emergent mode of perceiving cinematic immediacy and presence in which the observer is insistently 'here', 'blinking in the starlight' (another reference to embodied, binocular vision), and thoroughly immersed within a spectacle that is 'warm and real and bright'. The latter refers not only to the detail and reality effects of digital 3D but also to the fact that 3D cinema requires a more reflective screen and far more lumens from a projector than 2D cinema in order for stereoscopic relief, depth, and emergence effects to be vividly visible (it is no mistake, then, that Rapunzel's family emblem is a blazing sun). The idea that a spectator perceives this spectacle as a world that has 'somehow shifted' suggests both the extension of (volumetric) diegetic space into the space of reception as well as the uncanny familiar-but-strange dimensionality of the digital 3D image, its tendency to seem suspended, dreamlike, between the conventional two-dimensionality of film space and our 3D perceptual experience of the world around us. That the optical pleasure of 'seeing the

light' is joined to an emotional epiphany ('All at once everything looks different / Now that I see you') alludes to the use of romantic coupling as way of emblematizing digital 3D's affective seeing (hence in his review of the film, A.O. Scott describes the lantern sequence as 'almost tactile in its dreamy softness'[28]). Moreover, the musical number activates digital surround sound, which functions with digital 3D to enhance the illusion of immersion within the scene.

Adopting critical language coined by Eugenie Brinkema, we can say, then, that digital 3D's deployment of negative parallax to float CG objects from diegetic space to the space of reception 'gives form' to affect, promoting a mode of sensory perception that conflates vision with touch and optics with sensation and emotion.[29] The kinds of boundary violations the film takes up at the level of form and theme (particularly inside and outside, vision and touch, presence and absence) allows us to understand the peculiar—even uncanny—historical status of digital 3D as simultaneously old and new, strange and familiar. Digital 3D's floating objects return the spectator to the sense of illusory tangibility provided by the 19th-century stereoscopic 3D image and 20th-century 3D film, reuniting the spectator with emergent 3D objects (albeit in a different affective register) defined by their persuasive sense of tangibility and presence within the space of reception, thereby restoring in (new) digital cinema what had been lost with the (temporary) disappearance of older forms of 3D film and visual culture.

Cave of Forgotten Dreams 3D: Parallax Effects and Uncanny Affect

Like *Tangled 3D*, *Cave of Forgotten Dreams 3D* participates in digital 3D cinema's tendency to organize plot, narrative, and *mise en scène* (in the case of fictional film) or their arguments and/or revelations (in the case of the essay film) around the spatialized forms of affective and epistemic seeing organized along and by the z-axis. While *Cave*'s emergence effects promote affective seeing in order to communicate the sense of enchantment, haunting, and even shock arising from an encounter with the cave's perfectly preserved yet unimaginably old paintings, its depth effects promote curiosity and, with it, epistemic seeing, as they afford the spectator the opportunity to 'descend into the unknown' and venture (optically and sensorially) into

28   Scott, 'Back to the Castle', http://www.nytimes.com/2010/11/24/movies/24tangled.html.
29   Brinkema, *The Forms of the Affects*.

the farthest reaches of the cave. The film reverses the movement from enclosed, hidden space to open, spectacular space that structures *Tangled 3D*, instead moving from the cave's expansive, spectacular natural setting of the Ardèche River near the Pont d'Arc into the hidden, locked down space of the cave—accessible, like *Tangled 3D*'s hidden tower, through a small opening in a cliffside. Moreover, like *Tangled 3D*, *Cave* uses digital 3D to put into play and foreground categorical differences—particularly inside vs. outside, past vs. present, reason vs. senses, vision vs. touch—in order to trouble the boundaries that separate them. This blurring of boundaries is central to the film's use of parallax effects to promote a form of spectatorship that asks us, as Lutz Koepnick argues in his important analysis of the film, 'to see with our senses and to sense our seeing'.[30]

Cave exploits the links between positive parallax and the desire to look into depths in order to see and know that which has been concealed, hidden in darkness, buried, and forgotten. At the same time, Herzog uses positive parallax to establish the *limits* of the knowable and harnesses depth effects to the provocation of uncertainty that Ernst Jentsch located at the core of the uncanny.[31] In turn, Herzog aligns negative parallax with affective seeing, such that emergent images endowed with illusory solidity and tangibility efface differences between vision and touch and conjure up the fleeting illusion that one might reach across what Herzog calls the 'abyss of time' and forge a tangible connection to the unthinkably distant past. Digital 3D has the effect of 'remediating' the 32,000-year-old paintings as what Herzog calls 'memories of long forgotten dreams', such that they register traces of long-surmounted beliefs based, as the archaeologist Jean Clottes explains in the film, on notions of the permeability of, and fluidity between, the boundaries that separate the animate and inanimate, human and animal, living and dead, the material world and the world of spirits.[32] However, whereas in *Tangled 3D*, parallax effects eliminate the distance associated with diminished perception to immerse the protagonist (and the spectator) in a vivid display that allows us to 'see the light', *Cave* uses digital 3D to provide an immersive experience that ultimately underscores the limits of vision in the production of knowledge, regardless of the vivid clarity of the images on display. It is not surprising, then, that Herzog makes extensive use of those digital 3D aesthetics and artifacts that create 'immanent disorder' within the image by emphasizing the planar quality

30   Koepnick, 'Herzog's Cave', p. 273.
31   Jentsch, 'On the Psychology of the Uncanny', pp. 221-225.
32   On 'remediating', see Bolter and Grusin, *Remediation*.

of the 3D image.[33] In the process, Herzog distorts distance, scale, and perspective, producing what Anthony Lane refers to in his review of the film as 'that gray fuzz which still afflicts 3-D'.[34] Rather than use digital 3D simply to give the walls of the cave and its geological features vivid clarity and greater relief, Herzog also uses it to communicate the sense of enchantment and/or disquieting unease that arises from the eruption of the unthinkably distant past in the present. 3D allows Herzog to charge the space of the Chauvet Cave with the 'impression of unreality' that André Bazin associated with the format, in the process identifying the cave as a historically uncanny space that undermines both the boundaries that separate the past from present *and* the link between visibility and knowability.[35]

Digital 3D is particularly well suited to giving expression to the disquieting boundary violations at stake in the depiction of the cave as a historically uncanny space precisely because, as described above, its formal features and aesthetics are defined in part by their effacement of categorical differences (such as present and absent, tangible and intangible) and the transcendence of the screen as a surface that separates diegetic space from the space of reception. A return to Freud is helpful here. Working from Schelling's assertion that '*Unheimlich* is the name for everything that ought to have remained [...] secret and hidden but has come to light', Freud defined the uncanny as 'something which is familiar and old-established in the mind and which has become alienated from it only through processes of repression'.[36] These include 'surmounted' ideas such as the belief in animism, in magic, and the fantasy of returning to the womb—particularly as figured through the fear of being buried alive (all three of which are addressed thematically in *Cave*).[37] More important to digital 3D aesthetics, however, is the uncanny's categorical ambivalence. Tracing the etymology of *heimlich* and *unheimlich*, Freud explains that the meaning of *heimlich* tended to 'develop in the direction of ambivalence, until it finally coincides with its opposite, *unheimlich*', thanks to a secondary set of meanings linking *heimlich* to that which is secret and 'concealed, kept from sight, so that others do not get to know of or about it'.[38] Ultimately, Freud explains, '*Unheimlich* is in some way or other a sub-species

33   Crary, *Techniques of the Observer*, p. 126.
34   Lane, 'In the Dark'.
35   Bazin, 'Will CinemaScope Save the Cinema?', p. 283.
36   Freud, 'The Uncanny', p. 345, 364.
37   Ibid., pp. 364-367.
38   Ibid.

of *heimlich*'.[39] This ambivalence has been central to the work of scholars such as Laura Mulvey and Tom Gunning, who have analyzed the ability of specific media (photography and phonography, respectively) to produce uncanny effects through their effacement of the boundaries separating the past from the present, absence from presence, the living from the dead.[40] This final point is key, for digital 3D is so productively harnessed to the cinematic articulation of historically uncanny space precisely because it undermines the boundaries that normally separate sight and touch, distance and proximity, the immaterial and the material, film space and exhibition space. In *Cave*, parallax effects suggest that the various methods used to bring the cave paintings 'to light' only confirm that much of what the cave 'contains' and preserves is unknowable and resists rationalization; the use of 3D to articulate the cave's historical uncanniness in spatial terms is part of the film's project of registering an ineffable past that, in refusing to disclose itself completely, gains affective power by haunting the present through its sensible, persuasive 'presence'.

Significantly, digital 3D holds the illusory tangibility and persuasive presence it gives to the objects and scenes it depicts in a dialectical relationship with other stereo-aesthetics responsible for what Crary describes as stereoscopy's 'derangement of the conventional functioning of optical cues'.[41] As he explains:

> In the stereoscopic image [...] certain planes or surfaces, even though composed of indications of light or shade that normally designate volume, are perceived as flat; other planes that normally would be read as two-dimensional, such as a fence in a foreground, seem to occupy space aggressively. Thus stereoscopic relief or depth has no unifying logic or order. If perspective implied a homogeneous and potentially metric space, the stereoscope discloses a fundamentally disunified and aggregate field of disjunct elements.[42]

Herzog exploits the tension between the digital 3D image's hallucinatory clarity on the one hand and the 'derangement' accomplished by its stereo-aesthetics on the other, in a sequence that begins with a trip through a 3D data map of the cave and ends with an image of the scientists who use the

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39   Ibid., p. 347.
40   Mulvey, *Death 24x a Second*, pp. 54-65; and Gunning, 'Re-Newing Old Technologies', pp. 48-51.
41   Crary, *Techniques of the Observer*, p. 125.
42   Ibid., p. 126.

map posing inside the cave. A digital 'fly through' mobilizes the virtual camera from one end of the cave to another, taking us through millions of data points that plot out and account for every millimeter of the cave's surface. Created by digital scanners, the map, we are told, is the 'basis for all the scientific projects being done here' and it allows us to move optically through virtual space rendered as information. The fly-through emphasizes the immersive effects of positive parallax as the camera moves along the z-axis into and through the depths of the cave, engaging the viewer in epistemic seeing as it lays bare the details of the cave's topological structure and spatial orientation with a degree of transparency and clarity that is radically absent in the rest of the film. However, as we move through the space, Herzog says in voiceover, 'The painters of the cave seem to speak to us from a familiar yet distant universe', thereby emphasizing the otherworldliness of the cave and transforming the star-like, floating immateriality of the visualized data into emblems of a distant past that is immanent within the cave yet ephemeral, unknowable, and beyond reach. Schelling's use of the metaphor of 'bringing to light' the hidden and secret in relation to the uncanny is germane here. As the map's star-like data points suggest, it is the outcome of the efforts of the archaeologists to illuminate the contents of the cave using the scientific methods of the Enlightenment, an approach that contrasts sharply with Herzog's efforts throughout the film to illuminate the cave in a way that reproduces the effects that firelight would have had on the painted figures thousands of years ago, its flickering variability turning stillness into movement through a play of shadows that creates the illusion of glimpsing flashes of motion. Herzog brings the cave and its content 'to light' in ways that place the cave squarely within the domain of the uncanny, not only in terms of the various boundary violations the cave's artifacts mobilize but also in terms of the affective charge produced by the haunting sense of familiarity they provoke.

Not surprisingly, Herzog uses light in key shots to emphasize and exaggerate those stereo-effects that accomplish a 'derangement of the conventional functioning of optical cues' central to the project of using digital 3D to stage the cave as a historically uncanny space where the distant past haunts the present—and vice versa. This idea is very clearly expressed in an interview with the archaeologist Julian Monney (shot in the latter's office) that ends with a shot of Monney and another archaeologist, Valerie Feruglio, standing in the cave. Monney explains to Herzog that, 'The first time I entered Chauvet Cave, I had a chance to get in during five days, and it was so powerful. Then, every night I was dreaming of lions. And every

day was the same shock for me. It was an emotional shock. I mean, I'm a scientist but a human too, and after five days, I decided not to go back in the cave.' This emotional shock evidences the cave's affective power, as its painted prehistoric lions leave the locked-down space of the cave and invade Monney's dreams, cavorting through his unconscious with real lions. It is precisely this shock that *Cave* tries to communicate through the exploitation of parallax effects. Indeed, Herzog suggests that nothing less than shock is required to communicate the cave's uncanny historicity for, as the data visualization sequence indicates, the cave reemerged into a thoroughly mapped world saturated by all-pervasive information. Digital 3D's derealization of film space is necessary for the cave's re-enchantment and for Herzog's effort to wrest the cave from its status as a site from which data is to be harvested, quantified, and analyzed. In this way, Herzog 'asks advanced 3D technology to learn from the past and invites us to see our own seeing as part of a much older practice of enchanted looking'.[43] In other words, Herzog allows the epistemic seeing embodied and promoted by the scientists to give way to the affective modes of seeing afforded by digital 3D aesthetics.

Herzog's exploitation of the planar quality of the digital 3D image is important in this respect, and he uses digital 3D aesthetics and artifacts to create distortions in relief, scale, and distance in a way that foregrounds the cave's historical uncanniness. That is, in *Cave*, digital 3D reorganizes film space in order to articulate a particular conception of history in which the boundaries separating the distant past and the present, the living and the dead are unstable, fluid, and permeable. If the data map uses 3D to rationalize the space of the cave, to plot out every millimeter of its variable surfaces and recesses, thereby making the (relative) position, distance, and scale of each of the cave's topological features legible and knowable, then the shots of the scientists in the cave that follow shortly after effect a derealization of the space of the cave by distorting scale, relief, and distance, undoing the metric space of single-point perspective in order to undermine our sense of linear time. Following the interview, we cut to a shot of Monney and Feruglio positioned along the two-foot metal walkway that runs the length of the cave. Lit against a dark background, both remain almost perfectly still for the duration of the shot, sustaining the play between stillness and motion that is central to the cave's own figural depictions. Feruglio is foregrounded in the lower right corner of the frame, pictured from the chest up. Herzog manipulates the image to flatten her and create a blurry gray halo around

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43   Koepnick, 'Herzog's Cave', p. 275.

her, exaggerating what Klinger calls 3D's 'spectral effects'.[44] When combined with the stillness of her pose, this flattening seems to turn her into a 2D photograph, the surface of which appears to merge with that of the screen, giving her the odd appearance of being present within, but detached from, her surroundings—as if she occupies a separate plane of existence. Monney, visible from the knees up, stands midfield. In sharp contrast to the flattened appearance of Feruglio's image, Monney is given the 3-dimensional relief and sculptural solidity of a statue or waxwork. Monney also appears miniaturized and too small given his proximity to Feruglio and the camera. Behind him, the cave recedes in depth; backlighting illuminates stalactites and stalagmites in the background and exaggerates the 'planar quality' of the 3D image, in the process creating 'a vertiginous uncertainty about the distance separating forms' within the space of the cave.[45] Similar shots of other crew members and scientists posed in a state of near-perfect stillness also distort dimensionality, distance, and scale in much the same fashion, giving the scientists and crew an otherworldly appearance.

It makes sense, then, that digital 3D gives the archaeologists a ghostly and alienated presence in the cave such that they take on the appearance of spectral figures that invade and haunt the distant past, much as the prehistoric cave lions invade and haunt Monney's dreams in the present. Herzog later repeats the idea of the present invading the past when we see the crew walking through one of the massive, dark chambers previously laid out with such clarity by the 3D map. Herzog's voiceover explains, 'Dwarfed by these large chambers illuminated by our wandering lights, sometimes we were overcome by a strange, irrational sensation as if we were disturbing the Paleolithic people in their work. It felt like eyes upon us. This sensation occurred to some of the scientists and also the discoverers of the cave. It was a relief to surface again aboveground'. The irreality created by digital 3D aesthetics is central to the evocation and provocation of the (pleasurable) unease created by immersion within the cave's historically uncanny space and the 'blurring of time' created by the disquietingly vivid and pristine appearance of 32,000-year-old paintings that look, in Jean Clottes' words, 'as if [they were] done yesterday'.

Formal compositions that exaggerate z-depth and the planar quality of the image are used throughout the film to provide spatial articulations equal to the task of communicating the cave's blurring of the temporal boundaries separating the distant past from the present. For example, in

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44   Klinger, '*Cave of Forgotten Dreams*', p. 42.
45   Crary, *Techniques of the Observer*, p. 125.

a shot at the beginning of the film, Herzog is visible at the end of a narrow passage through which the scientists and crew must crawl in order to reach the cave's first large chamber. Here, positive parallax distorts the rows of calcite formations around the passage into a series of flattened planes that recede into depth (an effect enhanced by lighting), stretching the image along the z-axis and placing Herzog at a further remove than he actually is in space. Here, the tendency of the 3D image to produce a 'vertiginous uncertainty' about the scale of, and distance between, depicted objects corresponds to the film's provocation of a sense of uncertainty when it confronts the spectator with the vast historical distances that separate the recent past depicted in the film and those staggered moments (separated by [tens of] thousands of years) in the very distant past when the layered cave paintings and the calcite formations were created.[46] While negative parallax charges foregrounded elements with a phantom solidity that holds forth the possibility of forging a tangible connection to those past eras, the flattened planar quality given to elements in midfield and the background of the shot creates areas of occlusion behind each plane, suggesting that the knowledge produced as the scientists and the camera (and thereby the spectator) move into the depths of the cave is only partial—that each artifact and geological formation conceals as much as it reveals. Although the finite space of the cave has been thoroughly mapped in space and time, with the help of digital 3D, it seems to recede infinitely into the irretrievable past, simultaneously inciting and frustrating epistemic seeing, the desire to see and know. Hence, as this shot suggests, 3D does not oppose epistemic and affective seeing; rather, both unfold along the continuum of the z-axis, placing knowledge and affect, depth and emergence into dynamic (and even dialectical) play with one another.

This notion is most strongly suggested by the figure of the Chauvet Venus painted on a pendant that hangs from the ceiling in the farthest reaches of the cave. As Barbara Klinger argues, in its investigation of the Chauvet Venus, Herzog engages digital 3D in a 'fascinating game' of 'exploring what can be seen, what is difficult to see and what remains beyond technology's ability to reveal' to vision.[47] Our initial encounter with the pendant is structured by positive parallax and the provocation and frustration of curiosity. As the archaeologist Dominique Baffier explains, the walkway to which the scientists and crew must restrict their movements falls well short of the pendant, suggesting that much of the Venus and the rest of

46   Ibid.
47   Klinger, '*Cave of Forgotten Dreams*', p. 43.

the pendant will remain obscured. Baffier's description of the painting's inaccessibility is worth quoting at length. She associates the unreachable depths of the cave with the frustration of vision, thereby emphasizing how the incitement of curiosity and the promotion of epistemic seeing by positive parallax can ultimately function to establish the *limits* of visuality and knowability:

> Unfortunately there are things you won't be able to show in your film and that you won't be able to see. You can't get closer. That is the case with these absolutely marvelous paintings in the farthest chamber, this grouping of lions. It is especially the case with this rock pendant, where the lower portion of a woman's body has been painted. That is, you have her public triangle and her legs that separate starting at the knee, which diverge and are reminiscent of the well-known small early Stone Age statuettes from archaeological digs in the Swabian Jura in Germany. We can only see part of the lower half of the female body because we cannot access the other side of the pendant [...] So, you'll have to make do with this partial image.

Later, when Herzog and his crew return to shoot the cave by themselves, they attach the camera to a long pole to reach across the gap (a rudimentary tool that extends and literalizes epistemic seeing's inquiring movement into depth) and bring the pendant 'closer'—revealing a bison that embraces the lower body of the woman. Comparatively more (but not entirely) complete, this more proximate view reveals the pendant's status as a token of animism and, therefore, of the uncanny. Visible yet still enigmatic, the image seems to demand (over)analysis by several archaeologists who ultimately interpret it through the concepts of categorical permeability and fluidity. That is, the blurring of categorical boundaries so central to the uncanny was, as the archaeologist Jean Clottes explains, a key feature of the Paleolithic people's 'vision of the world':

> Traditional people and, I think, people of the Paleolithic had [...] two concepts which change our vision of the world. They are the concept[s] of fluidity and the concept of permeability. Fluidity means that the categories that we have—man, woman, horse, I don't know, tree, etc.—can shift. A tree may speak. A man can get transformed into an animal and the other way around, given certain circumstances. The concept of permeability is that there are no barriers, so to speak, between the world where we are and the world of the spirits.

Because the pendant remains only partially visible, Herzog displays in its place the 'Venus of Hohle Fels', a small hand-carved statuette with a lower body that is remarkably similar to the one painted on the pendant—a doubling that makes the pendant and the space of the cave all the more *unheimlich*. As one archaeologist explains, this artifact represents 'the absolute root of figurative depiction as we know it'. Herzog presents the Venus statuette (itself a token of the distant past and of 'surmounted beliefs', including animism and the fantasy of returning to the womb) in close-up as it floats against a black background, rotating slowly and bulging slightly past the surface of the screen with exaggerated solidity and relief. In the process of allowing the Venus of Hohle Fels to emerge past the surface of the screen, the emergent 3D image foregrounds the embodied nature of affective seeing by inciting the desire to reach out and touch the seemingly tangible statuette; at the same time, it also foregrounds the status of the emergent 3D image as 'a conjuration, an effect of the observer's experience of the differential between two other images', underscoring the fluidity between the categories of observer and observed, body and technology, upon which the perceptual experience of the stereoscopic 3D image depends.[48] Put differently, Herzog's use of negative parallax allows us to experience the artifacts on display and the format of digital 3D through what Jentsch calls the 'affective incitement of the uncanny'; though neither Venus is entirely knowable (because of the ways of life and belief systems they suggest), the 3D camera makes them and the challenges they pose to epistemic seeing uniquely *sensible*.[49] Hence, it is important to keep in mind this tension between the illusory solidity and persuasive tangibility of the emergent artifacts and paintings and the latter's potential for provoking an eerie sense of the object's irreality as they enter the space of reception as what André Bazin called 3D cinema's 'impalpable phantoms'.[50] If, as Anthony Vidler argues, the 'uncanny finds its natural place in stories centred on the idea of history suspended, the dream come to life, and the past restored in the present', it seems very much at home in the expanded film spaces constructed by *Cave of Forgotten Dreams 3D*.[51]

Like *Tangled 3D*, *Cave of Forgotten Dreams 3D* uses parallax effects to produce digital film spaces that force us to rethink the (pre-, proto-, and past) history of the cinema as a history of the dimensionality of the

48   Crary, *Techniques of the Observer*, pp. 122.
49   Jentsch, 'On the Psychology of the Uncanny', p. 217.
50   Bazin, 'Will CinemaScope Save the Cinema?', p. 283.
51   Vidler, *The Architectural Uncanny*, p. 47.

(moving) image. At the level of form, narrative, theme, and aesthetics, both films insist upon approaching the long history of moving image culture *axially*—and, therefore, spatially—by elaborating the various ways that a broad range of proto-cinematic media and cinematic formats (including digital 3D) have exploited flatness, depth, and the x-, y-, and z-axes to shape and mediate historically variable modes of spatialized seeing, feeling, and knowing.

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4. Reconfigurations of Screen Borders: The New or Not-So-New Aspect Ratios

Miriam Ross

Abstract

The ubiquity of mobile phone cameras has resulted in many videos foregoing the traditional horizontal (landscape) frame in favour of a vertical (portrait) mode. While vertical framing is often derided as amateur practice, these new framing techniques are part of a wider contemporary screen culture in which filmmakers and artists are using unconventional aspect ratios and/or expanding and contracting aspect ratios over the course of their audio-visual work. This chapter briefly outlines historical contexts in which the border of the screen has been more flexible and open to changing configurations than is widely acknowledged. It then uses recent case studies to consider how our understanding of on-screen and off-screen space is determined by these framing configurations.

Keywords: Aspect ratios, embodiment, framing, cinema

In recent years, the increasing ubiquity of mobile phone videos has drawn attention to a radical challenge to traditional screen culture. It is not just that a wide variety of amateur users now have a filmmaking device at their fingertips—rather, that many of them are foregoing the more than a century-long norm for shooting with a horizontal frame. Appearing on social media sites such as YouTube, Facebook, and Twitter as well as in commercial news broadcasts, their footage stands tall in a vertical format. When replayed on horizontal screens, the startling strangeness of wide black bands on either side of the content focuses attention on the border of the frame as well as seemingly absent screen space. While vertical framing is often derided as amateur practice, these new framing techniques are part of a wider contemporary screen culture in which filmmakers and artists are on the one hand using

unconventional framing with square aspect ratios (*Mommy*, Xavier Dolan, 2014) or vertical framing (Sonic Arts' Vertical Cinema series for the 2014 International Film Festival Rotterdam) and on the other hand expanding and contracting aspect ratios over the course of the film (*Life of Pi*, Ang Lee, 2012; *Oz the Great and the Powerful*, Sam Raimi, 2013; *The Grand Budapest Hotel*, Wes Anderson, 2014). In each case, comfortable understandings of on-screen and off-screen diegetic and non-diegetic space are problematized. This chapter will briefly outline a historical context in which the border of the screen has been more flexible and open to changing configurations than is widely acknowledged. It will then use the aforementioned examples as starting points to consider how our understanding of on-screen and off-screen space is determined by these framing configurations.

Introduction

Towards the beginning of the 2010s, a minor controversy in visual media spread across YouTube, Twitter, blog sites, and other social media. Gaining traction with the 2012 Glove and Boots YouTube video, 'Vertical Video Syndrome—A PSA', calls were made for mobile phone users to stop filming in a vertical (portrait) mode.[1] Assertions were made that those filming in a vertical rather than traditional horizontal aspect ratio were ignorant, uneducated media users who didn't understand the best-practice procedures of filmmaking, yet many of the so-called vertical videos reached millions of viewers through viral video success and/or were bought by mainstream news broadcasters for use on terrestrial and cable television. At the 43rd International Film Festival Rotterdam in 2014, Sonic Acts' Vertical Cinema section, featuring ten large-screen 35mm experimental shorts in a vertical format, introduced a high-art alternative to the mobile phone user's use of the aspect ratio.[2] Maintaining the distinction between portrait and landscape framing in painting, photography, and other visual arts, these shorts were visually distinct from the moving-image norm that has been dominated by a landscape, horizontal aspect ratio. Their presence at various film festivals in 2014 and 2015, as well as accompanying lectures by film academics and visual arts curators, demanded that this unconventional aspect ratio be taken seriously.[3] At the same time that these seemingly

1   Ross and Glen, 'Vertical Cinema'; Ross, 'Vertical Framing'.
2   Maheshwari, 'Angular Visions'.
3   For more details of these events, see http://verticalcinema.org. (Accessed 2 April 2017).

oppositional cultural spheres—of the amateur mobile phone filmmaker and the experimental film artist—were destabilising long-standing expectations for rectangular, horizontally oriented aspect ratios in moving-image culture, other alternatives were appearing in more mainstream cultural practice. Xavier Dolan's feature film, *Mommy* (2014), shot in a 1:1 square aspect ratio, received numerous film festival awards, while advertising companies increasingly produced content in a vertical format for the various non-horizontal electronic screens appearing in airports, train stations, and other public sites.[4] In each case, the use of new aspect ratios acted as a reminder of the importance of the frame in visual media, particularly the way the frame 'separates the materiality of spectatorial space from the virtual immateriality of spaces seen within its boundaries'.[5] The frame does, of course, interact with the physical parameters of the screen on which the image rests as well as the visible articulation of the image itself. For this reason, I consider the screen's borders to refer to the edges of the physical, hard-bodied space that projects or has images projected on to it, whereas the frame's borders are the visible edges of the image. In this way, the frame may be delineated as smaller than the screen and, if the image expands or contracts, the frame thus appears to expand or contract regardless of the physical parameters of the screen that are utilised.

Within the aforementioned contexts, changing aspect ratios are no trivial matter but have an impact on the embodied relationships we bring to our interactions with screen content and its delineated boundaries. Not just affecting our sense of physical distance and proximity to the borders of the image, different aspect ratios are able to help configure our immersion (or not) within visual fields and the way our multiple senses explore the way these visual fields are laid out. Some of the contemporary works that draw the most attention to the ways in which changes to aspect ratios can affect our embodied viewership are those that display the parameters of the screen but shift aspect ratios within it so that we reconfigure our perception of both the film's material body and our relationship to it.[6] Recent examples

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4   Some critics have suggested that a 5:4 aspect ratio, or otherwise vertical composition, is used, but interviews with Dolan and press material indicate the aspect ratio is square. Although this film is also relevant for its use of changing aspect ratios during the film (see Brown, 'Mommy'), there is not space to fully analyze it in this chapter.

5   Friedberg, *The Virtual Window*, p. 6.

6   For more on the way the film body operates as a material presence with its own perceptive and expressive qualities which at times reflect and simulate the human body's perceptive and expressive qualities while at other times creates its own embodied modes, see Sobchack, *The Address of the Eye*. See also Marks, *The Skin of the Film*; Barker, *The Tactile Eye*.

of feature films operating in this way are *Life of Pi* (2012), *Oz the Great and the Powerful* (2013), and *The Grand Budapest Hotel* (2014). While the afore-mentioned works are possible due to new screen technologies such as digital projectors and mobile screens, there are significant historical precedents that problematize any understanding of twentieth-century moving images as fixed within horizontal rectangular frames. This chapter will briefly outline a historical context in which the border of the moving-image screen has been more flexible and open to changing configurations than is widely acknowledged. While much of the focus is on cinematic works, a variety of different media utilizing moving images can be understood to operate within this context. This then leads the way for using the examples of feature films with changing aspect ratios as a starting point to consider how our embodied understanding of on-screen and off-screen space is determined by their aspect ratio configurations.

Historically Diverse Aspect Ratios

Some of the earliest moving-image motion studies, conducted by Eadweard Muybridge and displayed in his zoopraxiscope in the 1880s, were framed in a portrait orientation. Using human figures as the object of study, they exploited an aspect ratio that contained the upright body and little more. While promoted as part of a new science of photographic innovation, there was no attempt to hide the visual pleasure created by a gaze that removed the body from its surroundings in a manner that illustrated 'Foucault's point that the power exerted over bodies in technology is rendered pleasurable through technology'.[7] The use of a black-and-white grid behind many of the bodies reinforced the extent to which the frame was carefully placed so that the visually mechanized figures could be studied. In this way, there was nothing arbitrary about the use of vertical composition, and there was no need for a wider gaze that could detract from the seemingly scientifically relevant on-screen space. Although this aspect ratio quickly lost favour with the introduction of the 1.33:1, 35mm format that became an industry staple from 1889 until 1953, other aspect ratios played a role within cinema's first decades.[8] The circular frame produced by early Kodak cameras in the late 1880s gave way to experiments with square moving images by various early pioneers such as W.K.L. Dickson

7   Williams, *Hard Core*, p. 39.
8   Belton, *Widescreen Cinema*, p. 15.

(USA), Etienne-Jules Marey (France), and William Friese-Greene (UK). Using this format as well as the somewhat squat 1.33:1 aspect ratio, film-makers were able to compromise between the traditional portrait framing often used for human figures and the landscape mode in place for wider vistas. Although photography had commonly split these two subjects into different aspect ratios, early cinema's on-screen space needed the capacity to frame both. Early cinema is filled with examples of external shots that take in urban and rural landscapes as well as internal shots that focus on individual humans. As multiple-shot films developed, there was an increasing need for aspect ratios that could consistently deal with multiple subject matters within one frame. These aesthetic requirements combined with technological necessities (such as the need for space for perforations at the side of the image and a later need for space for the sound strip) and economic necessities (Thomas Edison's patent on the 1.33:1, 35mm format led other manufacturers to experiment with different ratios) during the production of different aspect ratios.[9] Thus, in John Belton's words, 'there is nothing "natural" about these formats'.[10]

With a greater emphasis on wide screen technologies from the 1950s on, a distinction arose in the second half of the twentieth century between the wider screen aspect ratio of cinema and the boxier ratio used in television. Yet there were moving-image works in both media that reconfigured these parameters either for artistic experimentation or due to technological necessity. In the former context, artist-filmmaker Paolo Gioli produced a number of 16mm film works with portrait aspect ratios such as *Film Stenopeico* (1973/81/89), *Commutazione con mutazione* (1969), and *L'operatore perforato* (1979), as did Bill Viola in video with *The Messenger* (1986) and *The Crossing* (1996).[11] Other work, such as Marina Abramovič's video installation *Cleaning the Mirror #1* (1995), used the configurations of television's standard aspect ratio in new ways. Abramovič's installation included five television sets with a slightly horizontal rectangular frame that were stacked vertically to form a column. Each television set displayed different footage of human anatomy that roughly corresponded to the height of a human standing next to the screens. Viewed together, they produced a continuity of on-screen space that created its own portrait framing even though it was roughly broken up by the edges of the television set. With regard to the context of technological necessity, 3D cameras such as the

9   McGowan, 'Widescreen', p. 221.
10   Belton, *Widescreen Cinema,* p. 18.
11   Bordwell, 'Paolo Gioli's Vertical Cinema'; *Young,* 'The Elemental Sublime'.

16mm Bolex camera had to produce two images (one for each) and so split the horizontal frame in two and recorded left- and right-eye images on each half of the frame. When exhibited, these two halves of the frame were fused together by an optical lens so that viewers seemed to see one portrait-framed image.

What is interesting about these examples is that they are impossible to view in a cultural vacuum. They stand out as different from the horizontal standard that predominates in the visual cultural contexts that surround them, in this way drawing attention to the uniqueness of their framing. Although dependent upon the exhibition space in which we see these works, if we are accustomed to a wider view, there is always the possibility that we would experience a physical sense of missing space, an invitation to question what would we normally see beyond the edge of the frame. In a contemporary context, one of the ways in which this is forcefully made apparent to us is when vertical videos are displayed on horizontal screens, creating a pillar-box effect with black bars running down the sides. It is this configuration that has drawn particular ire from opponents to vertical videos. Yet we can view this 'restriction' in a different light: what is so important in the on-screen space that it must be framed in this way, that our view should be bordered and limited to this content? As I have previously argued, although many vertical videos result from an almost accidental framing due to the embodied position the mobile phone user has when holding the camera upright, their portrait framing often suits the subject matter they are filming.[12] An unusual framing thus has the ability to concentrate on-screen space in certain ways, an aspect that can bring to our attention a sense of physical proximity to screen content. This aspect is articulated by Xavier Dolan in his justification for using a square aspect ratio during *Mommy*: 'the perfect square in which it consists framed faces with such simplicity, and seemed like the ideal structure for "portrait" shots. No distraction, no affections are possible in such a constricted space. The character is our main subject, inescapably at the centre of our attention'.[13] At the same time, restrictive framing need not only concentrate attention inwards. Depending on the content of the shot, tight framing in such a way can also provoke intensified relationships with the imaginary off-screen space, the wondering about what is beyond the frame and the potential for us to feel through multiple senses the limits of what we are able to see.

12   Ross, 'Vertical Framing'.
13   Dolan in Knegt, 'Xavier Dolan Gets Respect'.

The Changing Frame

Moving-image works that most acutely play with these parameters and our relationships to both on-screen and off-screen space are the next group of examples that can be drawn upon: works that change the parameters of the frame by shifting aspect ratios at some point in their duration. Although recent digital technologies have made it easier to reconfigure the frame's borders, historically diverse experiments have taken place. Perhaps one of the best known is Abel Gance's 1927 epic *Napoléon Vu par Abel Gance.* Experimenting with a variety of new technologies (including colour and 3D processes), Gance used a triptych system called Polyvision to expand screen images towards the end of the film.[14] During four sections—Les Deux Tempêtes, the Return to Corsica, Le Bal de Victimes, and the Entry into Italy—two peripheral screens adjacent to either side of a central screen displayed images that either expanded the shot on the central screen or provided distinct visual data to augment the central images. At its premiere in the Paris Opéra, this gave the impression that images stretched across a one-hundred-foot-wide screen. Although later screenings (particularly those organized by MGM) reduced the triptych images to three small pictures side by side on the main screen, audiences at the premiere were given a sense of how seemingly off-screen space can be brought into play.[15] In the expansion of a single shot, the newly available vistas suggested that a wider visual world demanded attention whereas the juxtaposition of adjoining images on different screens, seemingly with their own frame, more significantly questioned how we build space in our mental and embodied processes. Do we, both visually and with other senses, perceive a continuum of space that can be infinitely expanded and that we might enter into and interact with? Or do we perceive a compendium of different views and perspectives that our bodies will adapt to as we are brought into close contact with each one? As Kenneth McGowan notes in his comparison between Fred Waller's 1950s Cinerama widescreen technology and Gance's triptych system, 'Waller let his audience enjoy peripheral vision. Gance asked his to do a kind of peripheral thinking'.[16] There is thus an appeal to a cognitive understanding of how we experience space, but I would argue that this understanding is simultane- ously inflected by sensory understandings of how this space operates.

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14   Brownlow, *The Parade's Gone By*; McGowan, 'Widescreen'.
15   More recently, a restored version of the film that fully displayed the triptych sections was screened at the San Francisco Silent Film Festival in 2012.
16   McGowan, 'Widescreen', p. 224

In the former but equally well-documented context, the expansion of peripheral vision was not only strongly articulated but also had implications for teleological concepts of how screen space can and should be employed. When Cinerama was introduced at New York's Broadway Theatre in 1952, it began with a thirteen-minute black-and-white lecture on the history of art in a seemingly standard aspect ratio. The theatre's red curtains then opened further so that a panoramic, Technicolour image of a rollercoaster filled the expanded screen space in an aspect ratio of around 2.59:1.[17] While very much a publicity stunt for demonstrating Cinerama's potential, the expansion of space asked audiences to retrospectively reconfigure their relationship to what had seemed an acceptable standard of image construction at the beginning of the film. Going home to watch the black-and-white, boxier images on the burgeoning television set or returning to the movie theatre to watch the academy's standard aspect ratio, audiences were aware that an expanded frame was possible. Coming amidst a flurry of new technologies such as 3D cinema and surround sound—each of which competed to prove they were the 'natural' next step in audiovisual display—Cinerama suggested that seeing more, particularly at the peripheries of one's vision, was the future of cinema. Sixty years later, a similar process occurred when the advert for the 3D release of *Star Wars Episode 1: The Phantom Menace* (originally 1999, released in 3D in 2012) began with a smaller image on screen before expanding to a full image. As Ariel Rogers notes, 'such a strategy for suggesting the spectacular effect of a new technology through reference to the purported paucity of an older one (here, via the initial tiny internal frame) is familiar'.[18]

In each case, the intended effect was a sense of novelty and wonder at spectacular displays that could differentiate new cinematic technologies from predecessors and competitors. At the same time, other examples throughout the 20th century made it clear that expanding horizontal views were only one potential option and that expanding and contracting screen space in various directions could be implemented in flexible and vibrant ways. One of the most experimental was Glenn Alvey's Dynamic Frame system that produced images of varying size and shape by using movable mattes to control height and width during shooting. When viewed, space opened up in distinct horizontal and vertical courses, often in order to reveal new details or focus more intently on certain aspects of the image. In his review of Alvey's *The Door in the Wall* (1956), Derek Prouse states: 'one

17   Belton, *Widescreen Cinema*, p. 1.
18   Rogers, *Cinematic Appeals*, p. 139.

reacts less to the changing shape of the screen than to an awareness of the more highly charged nature of the space employed'.[19] In this way, viewers were asked to interact with spatial parameters and understand how they might be as important as the subjects that were being framed. In many ways, it was a realization of the 'dynamic square' that Sergei Eisenstein had proposed during debates in the 1930s where he was concerned with a 'passive horizontalism' that was emerging from industry developments in widescreen formats.[20] Eisenstein expected an overall square frame could contain dynamic aspect ratio configurations within it in order to actively engage audiences with screen content.

At the same time, more mundane occasions abounded in the numerous documentaries that incorporated archive footage and other visual material that did not conform to a single aspect ratio. In these works, there is often a greater containing frame that houses the different moving-image sections but in each sequence, a particular aspect ratio makes it clear how attention to the content should be concentrated. These are also numerous feature films that use split-screen processes within their duration.[21] For example, frames within frames were seen as early as the shot of a fireman day dreaming within Edwin S. Porter's *The Life of an American Fireman* (1903), and merging split-screen images were seen again in F.W. Murnau's *Sunrise: A Song of Two Humans* (1927). Producing multiple aspect ratios in one screen space, they normally structure relationships between the spaces and places represented in each set of images, asking us to create a fragmented but conceptually layered sense of the immediately visible on-screen space as well as the off-screen space that is both alluded to and sometimes briefly visualized. These visual formations build upon but are distinct from Noël Burch's description of the way feature films traditionally divide off-screen space into six segments: one to each side of the screen, the area behind the camera and any area occluded by the set.[22] Burch notes the different ways in which character movement and gaze out of and into off-screen space are able to help us imagine the existence of that space that does not have its own objective existence until, in certain circumstances, it is depicted in a reverse shot or different angle. Off-screen space's 'intermittent or, rather, *fluctuating* existence during any film' is complicated by split-screen processes that multiply and layer this space

19   Prouse, 'Report on the Dynamic Frame', pp. 159-160.
20   Eisenstein, 'The Dynamic Square', p. 49.
21   Hagener, 'The Aesthetics of Displays'.
22   Burch, *Theory of Film Practice.*

in ways that ask us to envision manifold connecting and disconnecting spaces simultaneously.[23] Their spatial arrangements conform more closely to Lev Manovich's description of spatial montage that, whilst developed by Manovich to refer to the visual organization of different windows on a computer screen, can also be applied to split screens in films as has been demonstrated by Bruce Isaacs' reference to *Time Code* (2000), *Dressed to Kill* (1980), and *Body Double* (1984).[24]

In these various moments, the shifting of audience relations to screen space also opens up the possibility for reconfiguring bodily placement. Considering Vivian Sobchack's point that 'photographic, cinematic, and electronic media have not only historically *symbolized* but also historically *constituted* a radical alteration of the forms of our culture's previous temporal and spatial consciousness and of our bodily sense of existential "presence" to the world, to ourselves and to others', different framings ask us to think about where the intersections and limits of our bodies in relation to screen space operate.[25] As previously noted, narrower framings and expanded views, as well as taller views and shortened views, have an impact on how we not only see visual space but also perceive with our other senses. In the shifts that occur when aspect ratios change mid-duration, there are already intensified physiological processes at work when these changing aspect ratios ask our eyes to scan moving images in different ways and with different attention. But we can also understand how our synesthetic and kinaesthetic sense of being in the world is also affected by the way space in front of us seemingly expands and contracts as well as seems to open up our view to space that was previously only inferred or imagined.[26]

Boundaries of On-Screen and Off-Screen Space

A recent film that stands out with regards to using changing aspect ratios to impact our bodily sense of space is *The Grand Budapest Hotel* (2014). Its visual fields, set mainly in the hotel that provides the film's namesake and the surrounding alpine village and countryside, already have a tactile

23   Ibid., p. 21.
24   Manovich, *The Language of New Media*.
25   Sobchack, *Carnal Thoughts*, p. 136.
26   For more on the way phenomenological processes of kinetic and synesthetic viewing operate, see Sobchack *The Address of the Eye*; Marks, *The Skin of the Film;* and Barker, *The Tactile Eye*.

and haptic sensibility in their use of heightened textures, particularly their nostalgic invocation of 1930s and 1960s design. Here I am drawing on Laura U. Marks' use of haptic (developed in her work to refer to specific intercultural cinema) that refers to embodied processes of viewing that interact with the surface of the image or, as Marks says, the skin of the film.[27] In particular, she is concerned with the way we may feel our way around images rather than regard them from an objective distance. Due to the design aesthetic of *The Grand Budapest Hotel*, sensory registers of how we might feel our way through its textured spaces are already in play, yet our embodied relationship to both space and place in the film is further informed by the way in which screen space contracts and expands. Unlike some of the more dramatic examples of shifting aspect ratios mentioned previously, the aspect ratios in *The Grand Budapest Hotel* contract and expand more subtly, moving from a somewhat boxy 1.37:1 to the wider 2.35:1, with other aspect ratios in between.[28] While the Fox Searchlight and Indian Paintbrush moving-image logos that precede the film use a 1.87:1 aspect ratio, in this way taking up the whole of the screen space in most exhibition contexts, the various sequences in the film's narrative sit within this space in different ways, never taking up the entire screen.[29]

An opening shot of the Old Lutz Cemetery has an aspect ratio of around 1.85:1 that, while similar in shape to the studio logos, is smaller in size so that it sits within the larger screen with black bands appearing both to the sides and above and below the shot. When the next sequence cuts to a flashback set in 1985 of the fictional author of a book titled *The Grand Budapest Hotel*, the aspect ratio shifts slightly to around 1.8:1, but the image also enlarges so that it takes up more of the screen. There are nonetheless still some black bands on all four sides. Less than three minutes since the beginning of the film, another cut takes us to a new aspect ratio of 1.37:1, showing two figures on a bridge high on a rocky outcrop in the mountains. In this instance, the black bands are now only visible to the sides of the image. There is also a different colour scheme, less saturated

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27   Marks, *The Skin of the Film*.

28   I have tried to provide the dimensions of the aspect ratios as accurately as possible. Verifying them is difficult when, for example, cinematographer Robert Yeoman, scholar David Bordwell, and film critic Ari Arikan provide different aspect ratios in the same book. See Seitz, *The Wes Anderson Collection*.

29   Many movie-theatre, television, and computer screens will have different screen dimensions, but in most wide-screen exhibition technologies this aspect ratio will appear to fill the screen space.

with pink and blue tones than the prior orange and brown tones of the writer's study. The author's voiceover describes it as the location for the Grand Budapest Hotel, which is also shown on screen with a somewhat twee façade. When we later return to this scene and aspect ratio, we find that it takes place in the 1930s and is the setting for the main portion of the story. Yet another cut, only a few seconds later, takes us to a different, seemingly more recent depiction of the hotel in 1968 where the appearance of the hotel has changed to a communist era set of geometric blocks. Within this setting, a younger version of the author is present, talking to the owner of the Grand Budapest Hotel, Mr. Moustafa, about events that occurred in the 1930s. This time, there is an aspect ratio of around 2.35:1 and the black bars only appear above and below the screen. In this way, a number of framing narratives—the Old Lutz Cemetery, the author in 1985, and the author in 1968—are in place, each with their own visual style and an aspect ratio that is wider than the boxy aspect ratio of the central narrative.

The transition between these narratives and aspect ratios is rapid, all occurring within the first few minutes of the film, and all focusing our attention on the different possibilities for framing action. When we are introduced to one of the central characters, the hotel concierge M. Gustave, in the 1930s narrative he is framed by open doors leading on to a balcony where he stands. These doors and their vertically hanging curtains further narrow our visual encounter with the image so that our eyes seem to be peering into a distanced view. Throughout this narrative, the camera often looks down corridors, into narrow rooms, or otherwise emphasizes a similar vertical framing within shots. We are very much positioned as outsiders looking in: the periphery—and its proximity to us and our embodied space—is far less important than what is occurring to the characters. Even when shots in this narrative produce dynamic close-ups on characters that come close to addressing us directly, the black bars on either side of the shot reiterate the characters' occupation of interior space. This aspect is emphasized even further due to the frequent visualization of physical frames within the image composition: the use of doorways, car windows, elevator doors, and train windows. In each case, the tactile surfaces of the film's interior designs, carefully textured costumes, and close-ups on characters' faces enhance Marks' haptic visuality, a sensation of touch passed from our eyes to our other senses.[30] However, the aspect ratio combines with the other framing devices to

30   Marks, *The Skin of the Film*.

posit us at a remove so that we are not within easy touching distance. In this case, we are in flux between the haptic visuality encouraged by the film's textured surfaces and an optical visuality (the counterpoint to haptic visuality which Marks suggests operates more commonly in mainstream cinema) that positions us in front of and outside deep space configurations. It is our bodies as much as our eyes that negotiate this proximity and distance.

This visual setup is distinct from shots in the wider aspect ratio of the 1960s setting in which two-shots are far more common. Although the 1960s narrative only briefly occurs in the film (but not as briefly as the other two framing narratives), it situates a different spectatorship of on-screen and off-screen space. In shots, such as the one of the author and a concierge in front of the concierge desk, a fisheye lens combines with the wide aspect ratio to suggest the image is bulging towards us. We are no longer peering into the film's interiority but rather seeing it presented towards us. Even without the use of the fisheye lens, the greater use of horizontal periphery space suggests the film body stretching closer to us, particularly when the camera pans from one character to the next in a way that indicates it might continue panning until it reaches where we are sitting. During these scenes, when haptic visuality is emphasized, the diegesis thus seems much closer to being within our physical grasp, allowing surfaces to be explored more intimately but also giving us the sense of how they might stretch beyond our centralized vision. In this way, the possibility of a continuing and embodied off-screen space is situated in comparison to the stricter delineation of space in the 1930s narrative where the centripetal focus suggests that what is outside the visible space is not important.[31] Although any one film, or other moving image work, might suggest these different on-screen and off-screen spectatorial relationships, it is the flux between different aspect ratios in *The Grand Budapest Hotel* that concentrates our attention on them. At one point in the 1930s narrative, Moustafa is narrating events via a voiceover when the author interrupts him. The latter questions why M. Gustave prefers blonde elderly ladies. At the same time that this vocal interruption emphasizes the humour of the imagery being suggested, there is a cut to the author in the 1960s setting. The jump between aspect

31   Bazin has discussed the extent to which painting encloses space in a centripetal manner whereas film expands it in a centrifugal manner. See Bazin, *What Is Cinema?;* Fowler, 'Into the Light'; and Monteiro, 'Fit to Frame'. In this way, the squatter aspect ratio of *The Grand Budapest Hotel* can be understood to have a more painterly tendency whereas the outward looking perspective of the wider aspect ratio suggests a more cinematic tendency.

ratios aids the humour by further emphasizing the interruption, but it does so not only through a visual demarcation but because the shift in aspect ratio disrupts our position in relation to the film's visual space more forcibly than traditional editing might.

Stereoscopic Expansion of Off-Screen Space

The two other films I will discuss, *Life of Pi* (2012) and *Oz the Great and the Powerful* (2013), have similarly expanding and contracting frames, but their stereoscopic (3D) versions bring into play a wider consideration of screen space. Like all stereoscopic films, the optical illusion that seems to expand content into the auditorium and behind the traditional plane of the screen encourages different embodied reactions from viewers in relation to the film. Viewers often respond in acute physical ways to stereoscopic content—reaching out to touch objects, ducking to avoid them. Yet even when their actions are not so pronounced, they are made aware of the extremely tactile and hyperhaptic dimensions of the films' visual fields, in particular the way these visual fields are no longer confined to a flat screen space.[32] The extra layers of depth provided by stereoscopy make textures seem more pronounced, and there is an ongoing play between the seeming proximity of objects and their extension away from viewers depending on how they are placed in the 3D visual fields, all of which have an impact upon haptic and optical visuality. While 3D systems are often promoted, in the same way that extreme widescreen cinema systems such as Cinerama and CinemaScope were, as a way to remove the frame by extending content beyond our peripheral vision, outside of IMAX 3D systems, the black borders surrounding the frame are still visible.[33] In this way, viewing relationships to on-screen and off-screen space are complicated by the seeming expansiveness of on-screen space into new areas at the same time that various off-screen spaces are alluded to but cut off from view by a visible frame. In both *Life of Pi* and *Oz the Great and the Powerful*, this configuration is further complicated by moments in which the frame, still visible but no longer quite such a stable container as it is in the 2D versions, expands and contracts.

In *Life of Pi*, this expansion and contraction occurs in just two brief moments, but each are significant for their reconfiguration of a stereoscopic

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32   Ross, *3D Cinema*.
33   Belton, *Widescreen Cinema*, p. 1; Lipton, *Foundations of the Stereoscopic Cinema*, p. 134.

screen space that usually has a uniform frame in 3D films. In the first instance, 1 hour 14 min into the film, there is a shift from the previous 1.78:1 aspect ratio. The shipwrecked Pi, stuck in a lifeboat with a tiger, is attempting to keep the tiger at bay with a hooked wooden pole. As he drops the pole and stands up to throw a fish at the tiger (towards us in negative parallax space), a cut takes us to a reverse shot in which the fish flies towards the tiger (into positive parallax space).[34] This new shot now has a different, thinner aspect ratio of around 2.28:1, with black bands above and below it. In a single shot, the fish continues to soar into positive parallax space before a series of cuts brings us to a shoal of flying fish cascading towards the boat's occupants and the viewers. The fish not only come into negative parallax space but also soar out above and below the frame, on top of and underneath the black bands. A series of edits show the fish flying at the boat from different angles, meaning that they come in on the black bands, go out on the black bands and/or fly horizontally across them. This action continues as their movement is shown under water, moving in similar directions and continuing to violate the boundaries both of the frame and of the flat screen plane. As director Ang Lee notes, this thinner framing allowed the fish to come out of the scene.[35] In its stereoscopic incarnation, viewers are thus given a heightened sense of the fragility of the frame's normal ability to separate what I have already referred to as the 'materiality of spectatorial space from the virtual immateriality of spaces seen within its boundaries'.[36] After almost two minutes of this action, a cut takes us to a later scene of Pi and the tiger in the lifeboat, and the original aspect ratio is restored. The transition into and out of the thinner aspect ratio is a subtle effect that may not be noticed unless pointed out but nonetheless combines with stereoscopic technology to have an impact on how viewers can experience this scene in embodied ways: they feel the fish come close to their physical position and the way the fish seem to move beyond them in the auditorium.

Similarly, the other aspect ratio change that occurs is also relatively subtle. At 1 hour 23 minutes into the film, there is a dissolve from a black night shot to an overhead shot of Pi and the tiger asleep in the boat with a whale swimming underneath. The shot is in the 1.33:1 academy aspect ratio with black bars visible to the sides. On the one hand, it is a direct visual

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34   Negative parallax space refers to the space that seems to appear in front of the screen plane whereas positive parallax space refers to the space that seems to appear behind the screen plane.
35   Ang Lee in Shawhan, 'Talking with Life of Pi Director Ang Lee'.
36   Friedberg, *The Virtual Window,* p. 6.

reference to the book cover of the novel on which the film is based, and the narrower framing helps make that reference more explicit.[37] On the other hand, it reminds us that there is nothing sacred about the illusionistic space created by the film and enhanced by stereoscopic depth fields. In the same way that the film and the book blur the lines between fiction and reality (mainly through a framing narrative that plays with the question of whether the spectacular events of the film really happened or were a figment of Pi's imagination), this shift of aspect ratio is a quiet reminder of the film's fictionalization of diegetic space in which space does not naturally occur but is artificially constructed and framed.

Oz the Great and the Powerful also uses an academy aspect ratio but this time at the beginning of the film. It opens with a black-and-white Disney Logo in a 1.33:1 aspect ratio that allows black bars to form on either side of the image. As our viewpoint travels in through the front doors of the Disney Castle and down a lengthy arched corridor to a proscenium arch stage, our movement into positive parallax space gives us the sensation of being sucked into an enclosed world. The visibility of the black bars enforces the sense that this space is interior rather than expansive. We continue moving forward through other black-and-white incarnations of the proscenium arch framing, which then give way to movement forwards and backwards through spirals and other geometric shapes that are layered with circus and Southern US imagery. In each case, we are encouraged to feel drawn into space rather than expected to wonder at what off-screen space may be available on either side.

Following a dissolve into the black-and-white diegesis of a fairground in 1905 Kansas, travelling cameras take us through the fairground until we reach a fire breather. Until this point, the edges of the frame have contained the action, with most objects residing in positive parallax space. When he breathes a long draught of fire, the flames shoot out over the edges of the black bands. In a similar manner to the flying fish in *Life of Pi*, the violation of the frame does not so much allude to and increase our knowledge of off-screen space but rather asks us to consider the possibility that the flames might reach our place in the auditorium. Although some gentle material such as clouds of smoke drift towards us and beyond the confines of the screen plane, most of the following action in the fairground remains clearly within the demarcated frame and stretching away from us in positive parallax space. It is only later, around 20 minutes into the film, that our embodied space will be incorporated again, through heightened use of negative parallax space

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37   Shawhan, 'Talking with Life of Pi Director Ang Lee'.

and an expanded view which suggests that the spaces of the film are far less easily contained. After the fairground magician, Oz, alights in a hot air balloon and experiences a tumultuous tornado, he finally touches down in a new land. During a single shot, the image becomes slowly saturated with colour at the same time as the edges of the frame expand to a wider aspect ratio of 2.35:1. In all, it takes around 20 seconds for this transition to occur. Utilizing negative parallax space, snowflakes drift out from the centre of the screen space at the same time that landscapes far behind the balloon are visible, in this way making it clear that the image is not just expanding to the sides but also towards us and away from us. Unlike *The Grand Budapest Hotel* and *Life of Pi* that use cuts to transition to different aspect ratios, this film thus uses an expansion within the shot in a manner that recalls the Cinerama screenings. In the fantasy vistas that populate the rest of the film, space and place are spectacular and varied, in many ways following the teleological traditions of the 20th century that brighter, wider, and deeper are preferred visual states. Even though the wider frame still limits our view into off-screen space, the latter's expansiveness and illusionistic continuity beyond the visual parameters created by our embodied position in front of the screen is suggested and brought into play.

Conclusion: Where Are the 'Correct' Aspect Ratios?

One of the significant features of these stereoscopic 3D films is that they are commonly released concurrently with 2D versions, normally via theatrical screenings but later with DVD, Blu-ray, and streamed formats.[38] Although 3D enthusiasts may argue that the stereoscopic versions are the preferred viewing format, commercial industries are keen to promote the equal value of their different versions. This context raises serious questions about how, and if, we can claim that 'correct' configurations of screen space can be put in place and prioritized. Writing about the home theatre enthusiasts that vocally debate the aspect ratios that are used in DVD releases, James Kendrick notes that an adherence to the aspect ratio used for theatrical screenings are preferred.[39] The extent of this preference is often articulated

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38 These versions can be expanded even further through the use of screening formats such as IMAX. For example, *Guardians of the Galaxy* (2014) incorporated expanding and contracting aspect ratios in its IMAX 3D version but not during other screenings. See Anderton, 'Marvel's "Guardians of the Galaxy"'.

39 Kendrick, 'Aspect Ratios and Joe Six-Packs'.

through hierarchies of taste in which 'home theatre enthusiasts attempt to shape a particular mode of film presentation and viewing for the home theatre environment by denouncing competing modalities as lesser, inappropriate or "illegitimate" uses of DVD technology'.[40] He goes on to state that, 'the DVD, then, unlike either the videocassette or laserdisc, is a home theatre format designed from the outset for the presentation of widescreen films in their original aspect ratios. To do otherwise is, from the cinephile's perspective, not only an insult to cinematic art but a subversion of the use for which the format was intended.[41] Some of their strongest criticism is aimed at pan and scan techniques or techniques that un-matt areas of the images in order to make widescreen films fit narrower aspect ratios, arguing that these techniques cut off space that was meant to be viewed or introduce space that the filmmaker never intended to be seen.[42] Thomas J. Connelly expands this context to discuss viewer frustration that arises when broadcast television is also modified to fit the wider screen space of high definition television sets.[43]

In each case, the removal or expansion of screen space to fit new screens and their correspondent frames concentrates attention on where the limits of on-screen and off-screen space begin and end. Although viewers may argue that pre-determined and artistically constructed limits are violated by post-release changes to aspect ratios, as Connelly points out, 'certain films are photographed for both theatrical and nontheatrical screens, complicating the issues of a true or original aspect ratio'.[44] This is confirmed by Kendrick's discussion of the Super35 film format, used by filmmakers such as James Cameron, that is similar to standard 35mm film stock but without an encoded soundtrack so that there is more room on each frame for visual information. By matting the frame in different ways during postproduction, variable aspect ratios can be created, most often 2.35:1 for theatrical screening and 1.33:1 for the home. 'In essence, this means that there is no one "true" aspect ratio because the filmmaker deliberately framed his or her shots for both versions.[45] These examples, as well as the stereoscopic

40   Ibid., p. 58.
41   Ibid., p. 61.
42   Belton, *Widescreen Cinema*, p. 222; Guldbransen, 'Danes Back Pollack in Pan & Scan Case'. Pan and scan is a technique during which an editor selects relevant parts of the image and crops and scans them to fit a new aspect ratio. When relevant parts of the image shift, the editor pans to the new area to be cropped.
43   Connelly, 'Mapping Aspect Ratios'.
44   Ibid., p. 185.
45   Kendrick, 'Aspect Ratios and Joe Six-Packs', p. 64.

versions of films that expand screen space out towards and away from the viewer in ways that complicate on-screen and off-screen space, thus raise the question: does a core delineation between on-screen and off-screen space remain in these multiple versions? It is a question that is reiterated in Stephen Monteiro's analysis of new screen modes emerging from portable technologies such as phones and tablets, in which he suggests the screen is privileged so that 'the object is reinforced while the image must adapt. Filling the screen surface with the image has become a priority, even when this risks alterations to the image's original aspect ratio or internal, formal relationships'.[46] Countering this, some moving-image works will continue to be created in contexts where one 'correct' aspect ratio is emphasized and thus stricter delineations of screen space will prevent the image from needing to adapt, but we are currently in a media environment in which fluid and multiple possibilities are becoming increasingly common.

The debates around 'Vertical Video Syndrome' and the continuing controversies surrounding pan and scan or other reframing techniques highlight a tension between the expansion of screen technologies and their diverse permutations on the one hand, and concerns with artistically enforced delineations between on-screen and off-screen space on the other hand. While it is easy to rationalize various points in these debates through calls to take into account *visual* framing and concentration of space, we should not forget that there are embodied reactions, whether consciously or subconsciously manifest, in viewership of different aspect ratios. We are encouraged to feel our way through the places created by on-screen and off-screen space in various ways, and changing aspect ratios play their own role, whether experienced pleasurably or displeasurably, in that process.

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46   Monteiro, 'Fit to Frame', p. 360.

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5.   Face, Frame, Fragment: Refiguring Space in Found-Footage Cinema

Allan Cameron

Abstract

In experimental 'found footage' films by Peter Tscherkassky, Nicolas Provost, and Gregg Biermann, the relationship between the cinematic face and frame is refigured. Using techniques of superimposition, distortion, collage, and montage to manipulate familiar screen faces and settings, these films invite us to reinhabit familiar cinematic worlds while reframing and rearticulating their spatial dimensions. In doing so, they concentrate not only on the face as visible expressive element but also on the spatiotemporal gesture of facing. The face thus becomes a pivot around which to orient explorations of surface and depth, figuration and fragmentation. By teasing apart and rearranging the relationship between cinematic faces and spaces, these works point cinema in new directions.

Keywords: Faciality, spatiality, experimental film, remix, collage, montage

In narrative cinema, the human face and the film frame are intimately connected in ways that might seem obvious but are, for that very reason, easy to overlook. Arguably, one underwrites the value of the other. Whereas landscapes and streets are all too readily interpretable as 'empty spaces', the presence of the face provides assurance that we are looking at a potential object of dramatic interest—the face occupies the frame, in other words, and authorizes it in the process. Similarly, the frame vouches for the significance of the face, scrutinizing it intently in the close-up, or, by placing it strategically in wider compositions, underlining its importance as

a narrative, spatial, and affective anchor point.[1] Furthermore, as the bearer of the 'look' in two senses (as the site of the visual organs and the primary zone of affective expression), the face collaborates with the frame in the articulation of dramatic space. In a number of contemporary experimental 'found footage' films, however, this intimate connection between face and frame forms the basis for an investigation and renegotiation of screen space, as fragments of narrative cinema are disarticulated, superimposed, distorted, and juxtaposed.

Approaching the face as an identifiable figure that can be distinguished from its ground, these films also use a number of techniques—notably collage and montage—to disrupt or overturn the figuration of the face. For the purpose of this discussion, I consider montage as a diachronic approach that suggests conceptual and/or spatiotemporal connections *in time*, while collage is a synchronic, additive approach that emphasizes *spatial* juxtaposition.[2] Some of these films rely primarily upon montage, while others create synchronic collage effects by producing visible or invisible seams within the frame itself, emphasizing visual boundaries and fragments. In each case, as fragments of the cinematic origin text are modified, layered, or reordered, figure and ground enter into a push-and-pull relationship—in some instances, the spatial environment subsumes the face; in others, the face is cut free from its surroundings. Collectively, these works use faces as a pivot around which to orient explorations of surface and depth, figuration and fragmentation. In doing so, they concentrate not only on the face as visible expressive element but also on the spatiotemporal gesture of facing.[3]

1   Film scholarship has tended to view the facial close-up, in particular, as integral to narrative cinema: from Béla Balázs' early theorization of cinema's 'mighty visual anthropomorphism' (in Balázs, *Theory of the Film*, p. 60) to Deleuze's assertion that 'The affection-image is the close-up, and the close-up is the face' (in Deleuze, *Cinema I*, p. 89). As Mary Ann Doane puts it, 'The close-up, together with an editing that penetrates space and is at least partially rationalized by that close-up, seems to mark the moment of the very emergence of film as a discourse, as an art' (in Doane, 'The Close-Up', p. 91).

2   This difference is not insisted upon by all writers on film. William Wees, in his influential account of found-footage cinema, sees 'montage' and 'collage' as functionally equivalent: 'As far as I am concerned, either term will do, so long as it is understood to mean the juxtaposition of pre-existing elements extracted from their original contexts, diverted [...] from their original, intended uses, and thereby made to yield previously unrecognized significance' (Wees, *Recycled Images*, p. 52). The distinction I have suggested may also be difficult to maintain in other contexts, for example in relation to photomontage, which involves the combination of disparate elements within a single frame.

3   Although my emphasis here is primarily spatial, it is worth noting that the dominant strand in discussions of found-footage cinema has to do with its historiographic potential. See, for

In their recycling and reshaping of scenes from classical cinema, remix films like Peter Tscherkassky's *Instructions for a Light and Sound Machine* (2005) and Gregg Biermann's *Spherical Coordinates* (2005) can be aligned with what Thomas Elsaesser describes as a contemporary, second-wave cinephilia in which viewers are able to access, reframe, and re-present images across different contexts and media formats.[4] 'Cinephilia [...]', he argues, 'has re-incarnated itself, by dis-embodying itself'.[5] The wholesale sampling of canonical cinema in contemporary video art, from Douglas Gordon's *24 Hour Psycho* (1993) to Christian Marclay's *The Clock* (2010), arguably provides an aestheticized parallel to this disembodied cinephilia. However, as Christine Sprengler argues regarding contemporary art's re-cycling of Alfred Hitchcock's films, such works are not only cinephilic but also 'epistemophilic': that is, they 'add insight to aesthetic, historical, and even theoretical discourses on the cinema'.[6]

Accordingly, I argue that a number of contemporary experimental films work to illuminate the relationship between face and frame in classical cinema while exploring how face and frame might be reorganized into new permutations. Thus, these films arguably point not only to the face *in* cinema but also towards the diverse ways in which we face cinema itself in the post-cinematic era, encountering it at different scales, angles, and locations, from theatre to gallery to cellphone.[7] Returning us to well-known screen faces and settings, these films invite us to reinhabit familiar cinematic worlds while reframing and rearticulating their spatial dimensions. At the outset, they engage us through a dynamic of recognition: it is the faces of the stars that draw us to these images, from Janet Leigh's panicky glances to Clint Eastwood's signature squint. In recycling such images, these experimental films highlight the face's role as cinephilic figure, but also look around and behind it—not simply to deface it but to initiate a fresh encounter, unlocking recognized, reified cinematic spaces so as to experience them anew and reflect on their constitutive codes and structures.

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example, Anderson, *Technologies of History*; Danks, 'The Global Art of Found Footage Cinema'; and Russell, *Experimental Ethnography*.

4   Elsaesser, 'Cinephilia', p. 37.

5   Ibid., p. 41.

6   Sprengler, *Hitchcock and Contemporary Art*, p. 11.

7   Accordingly, the works discussed here span a variety of exhibition contexts: while all have screened theatrically, Peter Tscherkassky's films have been released commercially on DVD, Gregg Biermann's streamed via the online video-on-demand service Fandor, and Nicolas Provost's projected in gallery settings.

William Wees has observed that 'found-footage films nearly always have the effect of bracketing the images and calling attention to them as images, as constructed representations, and therefore as something that can be deconstructed or "undone".[8] Referring to the situationists' notion of détournement '(from détourner: "to turn away, to turn aside, to lead astray, to divert, to embezzle, to highjack")', he goes on to discuss how seminal found-footage filmmakers (including Joseph Cornell, Bruce Conner, Mattias Müller, and Martin Arnold) have used détournement to magnify or, alternatively, to undermine the auratic power of Hollywood stars. However, my primary focus will be not so much on the Hollywood face in its own right, but more on the way that spatial relations are articulated around these recognizable figures. I want to repurpose détournement and use it in a more literal sense. By entering into a play with cinematic space, certain filmmakers have managed a spatial détournement, in which the frame is figuratively turned on its axis in order to produce alternative types of spatial relations. Here, face and space are, variously, folded in on each other, reoriented towards the frame's edges, or projected beyond them (not only into 'off-screen' diegetic space but also the non-representational 'off-frame' space defined by the material boundaries of the image). In the examples I discuss here, the face is crucial to this détournement of the frame. Each of these works involves a reorientation of face and frame via processes of disfiguration, transfiguration, and configuration.

In short, *disfiguration* operates by fragmenting or disrupting the image, *transfiguration* by remoulding it anamorphically, and *configuration* by placing images into new arrangements with one another. In each case, the dimensional qualities of the source images are transformed, as these works operate reflexively on the spatial qualities of classical cinema. As Rudolf Arnheim points out, cinema brings together two types of spatial organization, one two-dimensional and one three-dimensional.[9] Narrative cinema depends upon the spatial limitations of the former aspect, which Arnheim refers to as 'pictureness': it is the weak 'spatial impression' of the film image that allows it to be articulated with other images, thus making montage possible.[10] The films discussed here tamper with the relationship between

8   Wees, 'The Ambiguous Aura of Hollywood Stars', p. 4.

9   Arnheim, *Film as Art*, p. 59.

10   Ibid., p. 29. Stephen Heath makes a similar point when he argues, from the standpoint of suture theory, that 'the fiction film disrespects space in order to construct a unity that will bind spectator and film in its fiction' (Heath, 'Narrative Space', p. 101). For Edward Branigan, taking a cognitivist perspective, it seems that 'narrative is function which correlates imagined space-time with perceived space-time' (Branigan, *Narrative Comprehension and Film*, p. 62).

'pictureness' and spatial depth. I argue that they produce consonant effects via strikingly different techniques, from fragmentation (disfiguration) to morphing (transfiguration) to juxtaposition (configuration). Foregrounding the mediality of the image—from the sprocket holes of celluloid stock to the algorithmic convolutions of the digital—they rearrange topological relations among images and image layers.[11]

As a privileged cinematic figure, the face intervenes in topological spaces by mediating between proximity and distance, flatness and depth. In this respect, the disarticulated, remoulded, and counterposed faces in these films both underline and amplify the dimensional ambiguity of the face in classical cinema. On the one hand, the close-up (commonly associated with the face) has the power to flatten space. As Mary Ann Doane (citing Gilles Deleuze and Béla Balász) comments, 'it is the close-up that is most fully associated with the screen as surface, with the annihilation of a sense of depth and its corresponding rules of perspectival realism'.[12] On the other hand, facial directionality and the associated geometry of the look is used to set up dramaturgical relations within a scene, connecting spatial depth with narrative potential. Accordingly, Paul Coates sees the traditional orientation of the 'three-quarter face' as crucial to mainstream cinema because it opens into narrative: 'the partial averting of the face grants it the status of something in motion, a rudder steering a set of actions'.[13]

In the 'found footage' films discussed here, the dimensional variability of faces and spaces—their oscillation between flatness and depth—takes place via the (re)articulation of the frame. As Edward Branigan points out, however, there are myriad ways in which the term 'frame' can be understood. It can refer to, among other things, the image's outer edge, its composition or content, its perceived periphery or its perceived totality, or it can even describe the role of sound.[14] I will use it primarily to nominate the physical boundaries of the image but also, where relevant, the visual field delineated by such boundaries as well as the various 'internal' frames produced within the image itself (through such means as revealing the edges of the filmstock, inserting 'vignette' or 'cameo' effects, and introducing fissures and edges, whether real or virtual). My conception of the frame thus maintains a central

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11   Topology is determined by geometrical properties rather than physical ones—meaning that spatial relations between objects are maintained even when their size and shape is altered. Topology can thus be contrasted with the surface mapping of topography, in which scale remains constant.

12   Doane, 'The Close-Up', p. 91.

13   Coates, *Screening the Face*, p. 33.

14   Branigan, *Projecting a Camera*, pp. 103-113, 116.

emphasis on its literal, material aspect but is also layered and somewhat flexible. The decontextualization of found-footage cinema, I argue, not only renders both face and frame as discrete fragments but also organizes them into new relationships of flatness and depth. Space is thus dynamically *refigured* (whether disfigured, transfigured or configured)—shaped into different forms as well as articulated around distinguishable faces and objects.

The Disfigured Frame

Peter Tscherkassky's *Instructions for a Light and Sound Machine* (2005) uses as its source material Sergio Leone's spaghetti western *The Good, the Bad and the Ugly* (1966), submitting it to a logic of overwriting and disfiguration.[15] Working in a darkroom studio with strips of film, Tscherkassky uses a laser pointer to optically print selected regions of different frames onto black-and-white stock. Repeating this process many times over, he produces extraordinarily dense and layered composite images. This process is emphatically analogue-based, an engagement with the raw technicity of celluloid cinema that is reflected in the film's matter-of-fact title as well as its exploration of film's physical boundaries—in particular, the boundary constituted by the frame. Although *Instructions for a Light and Sound Machine* arguably seems more concerned with frames than with faces *per se*, there are a number of key moments at which Sergio Leone's original orchestration of faces and landscapes becomes a springboard for experiments with spatial dynamics.

Tscherkassky's film opens with an image showing a man opening a window and peering through a telescope. This image, rendered in negative and repeated over and over again throughout the first part of the film, appears to motivate a chain of 'reverse shots', although there are no other cues to confirm a shared diegetic space. Following an array of cameo images drawn from various moments in the source film, we are presented with a wide landscape shot. A face now swings into frame, obscuring most of the backdrop. Although grainy and unstable, and transposed into black and

15   Writing on Tscherkassky's work tends to treat it as a kind of 'critical cinephilia', which works by engaging with, rather than rejecting, classical cinema. See Balsom, 'A Cinephilic Avant-Garde', p. 264. In Tscherkassky's *Outer Space* and *Dream Work*, argues Michele Pierson, 'the critical work of analysis begins [...] with the intensification of the sensory experience of cinema' (Pierson, 'Special Effects', p. 44). For Alexander Horwath, '*Outer Space* is no longer the "parallel space" of the avant-garde, but in fact the "world space" of cinema' (Horwath, 'Singing in the Rain').

white, this shot is recognizable as the opening image of *The Good, the Bad and the Ugly*. It is followed by a chain of similar close-ups and medium close-ups selected from different scenes, showing hard-faced men staring adversarially into off-screen space. Deployed out of context, these shots of faces have no clearly identifiable corresponding reverse shots—are they looking at each other or at some other object or vista? This sequence implies a mysterious composite space beyond the frame, crisscrossed by looks and counterlooks.

In this way, *Instructions for a Light and Sound Machine* references the source film's obsessive exploration of faces and landscapes via widescreen compositions.[16] In Leone's cinema, the intercutting of extreme facial close-ups with remote wide shots invites us to read one through the lens of the other: the immobilization of the face, its hypermasculine inexpressiveness, turns it into a kind of landscape. In this sense, faces in Leone's films are thoroughly infiltrated by space. Reworking this material, Tscherkassky amplifies the air of spatial uncertainty that already haunts the original film. In the source film's opening 'face-off', which Tscherkassky samples heavily, the characters appear almost to be looking down the barrel of the lens. The spatial relations between the extreme wide shots and confronting close-ups are eventually established, but it takes time for the orientation of the 180-degree axis to become clear. Yet in a sign of its tenuousness, Leone also crosses this axis in the opening scene, briefly reversing the screen direction of the advancing combatants just before they reach each other. Ultimately we realize that, despite appearances, these men are not moving along a linear vector of action: rather than confronting each other, they are converging on the same building, where they hope to capture another character in order to earn a bounty.

In resampling and re-editing this footage, Tscherkassky magnifies its sense of uncertainty: the unreadability of Leone's screen faces translates into an intensified unreadability of cinematic space. At times, given the directness of the characters' stares (parallelled by the direct 'look' of the telescope, which seems almost to be aimed at the viewer), space itself threatens to flatten out altogether: that is, the characters appear to stare not towards each other, thus opening up spatial dimensionality, but towards the two-dimensional plane of the film screen. Tscherkassky thus takes

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16   Erika Balsom comments on Tscherkassky's use of CinemaScope in relation to Leone's source material but also positions it within another tradition of widescreen aesthetics, which works by 'fragmenting the image into multiple planes or using its vastness to orchestrate an intricate visual spectacle' (Balsom, 'A Cinephilic Avant-Garde', p. 265).

advantage of the facial geometry of the spaghetti western—the network of inscrutable looks and counterlooks that orchestrate space and pave the way for the gunfire to follow. Appropriately, in *Instructions for a Light and Sound Machine*, the series of unanchored facial close-ups described above is followed by a fusillade of gunshots. Rapidly interspersed shots of gun barrels cross the frame, both as positive and negative images, emphatically cancelling out the preceding images of the face while underlining the original film's alignment of looking and shooting.

At the same time, Tscherkassky breaks apart the integrity of the face itself, deploying the same technique he used in earlier works, including the much-discussed *Outer Space* (1999). Using a complex optical printing process, Tscherkassky selects and layers elements of different frames, radically recomposing his sampled material. The result is a barrage of images in which frames, bodies, and faces are multiplied atop one another, becoming unstable, fragmented, and, through the collapse of depth and compositional order, dramatically *dis*-figured. As Christa Blümlinger has observed, *Outer Space* also involves an intensive exploration of faciality. Drawing footage from horror movie *The Entity* (Sidney J. Furie, 1982), in which Barbara Hershey plays a woman who is tormented (and sexually assaulted) by an unseen supernatural force, the film breaks up Hershey's face with flurries of shadows and multiplies it across the frame, even as the frame itself seems to explode. Sprocket holes and framelines become visible, as both face and frame are violently shattered and refracted. Blümlinger points out that in *Outer Space*, the cinematic spectacle of violence against the female body is, according to a dynamic of repression and punishment, directed instead against her face. Like the shower scene in Hitchcock's *Psycho*, she argues, Tscherkassky's film depends on 'the figurative opposition of the female face and the space that surrounds it'.[17] This figurative opposition, however, is projected into the very materiality of the celluloid, so that the threat comes not so much from off-screen space as from off-frame space.[18] That is, the narrative threat of off-screen space (which lies outside the frame but within the diegesis) gives way to the purely formal threat of off-frame space (which is defined by the technical boundaries of the image). In *Outer Space*, the frame itself has an ambiguous mediating role, both receding from and advancing into view. At

17   Blümlinger, 'Found Face'.
18   James Cahill suggests that these films work by 'foregrounding the inherent tension between interiority and exteriority' in Cahill, 'Anacinema', p. 94. Similarly, Akira Lippit argues that *Outer Space* delineates neither outer nor inner space but the space between the two, the imaginary space that opens between a film from a film, ex-film' (Lippit, *Ex-Cinema*, p. 9).

one point, for example, the black ground of the image becomes populated with unmoored facial fragments in the form of multiple vignetted eyes. The rectangular logic of the film's physical boundary is thus suppressed, as each fragment produces its own diffuse 'frame'. Elsewhere, however, the image is marked by an excess of linear framelines, supplied by superimposed windows, mirrors, doorways, and, not least of all, by the edge of the film strip itself, which intrudes violently upon the scene.

We might, then, see *Instructions for a Light and Sound Machine* as an attempt to do for the male face what *Outer Space* does for the female. In this case, the challenge of the masculine stare in *The Good, the Bad and the Ugly* is deflected into an uncertain space beyond the frame, refiguring the relationship between the film's hard-faced characters and the spaces they seek to command. Furthermore, the film channels both real and implied aggression and directs it against the face. As the film reaches its crescendo, the frame stutters and slips while images of facial anger and violence (which include a character having his eyes gouged) seem to be layered atop one another. In this instance, Tscherkassky combines elements of collage and montage: on the one hand, he allows frame lines to split the image along the horizontal axis, producing discontinuity and disjuncture within the frame; on the other hand, he uses rapidfire montage to create a flickering effect, alternating frames at such speed that they appear to infiltrate each other's figurative spaces.

At another point, the face-frame relationship is approached more directly, as a lynching scene featuring Eli Wallach (in the role of Tuco, or, as per the original film's title, 'the Ugly') is radically reframed. Dangling from a tree, Wallach's countenance flickers and slips until finally his swinging head and face, framed by the noose, appears to become dislodged from its profilmic backdrop and sways back and forth across the visual field, occupying its own roughly cropped frame. Once again, Tscherkassky plays with vertical orientation, allowing framelines to roll up across the image but also superimposing and interpolating other objects and environments, including images of fleeing and captured animals, a skeleton in a coffin, a horse-riding figure, and Clint Eastwood's character (Blondie, aka 'the Good') taking aim with a rifle (in the original film, this character is attempting to sever the rope suspending Tuco, although here that moment of release appears eternally suspended). The footage of the swinging man is also duplicated, overlaid, and even inverted, so that the image appears, in a sense, to have been multiplied by itself. Ultimately, Wallach's embattled figure is confronted by the material substrate of the film: not only framelines, sprocket holes, and broken edges but also the segments of leader marked

7. Still from *Instructions for a Light and Sound Machine*, Peter Tscherkassky, 2005. 17:00. Courtesy of the artist.

with the sync sound countdown and, in a neat pun on the framing of Tuco's predicament, the words 'PICTURE', 'HEAD', and 'TAIL'.

These examples can be considered a specific type of what Pascal Bonitzer calls 'deframing'. Deframing refers to the off-centre angles and frames of modernist cinema, which produce empty spaces and push human figures to the periphery of the frame.[19] Edward Branigan describes deframing as a kind of 'antisuture' that produces disfigurement: 'In a deframed image, something human has been lost or drained away, cruelly *dis*figured, but the spectator has arrived too late to witness how the frame/lines were *broken* and used "as a cutting edge".'[20] Although Bonitzer's term is not intended to refer to visual fragmentation *per se* (Bonitzer notes that 'the fragmentation of figures is a well-known cinematic device'), Tscherkassky's distinctive approach produces a kind of deframing *through* fragmentation.[21] In *Instructions for a Light and Sound Machine*, deframing radically decentres the human body and face while multiplying the film's arsenal of 'cutting edges'. This marginalization of the human is mirrored at the structural level: the protracted 'remix' of Tuco's lynching, which Tscherkassky places at the film's midpoint, is followed by a passage of abstraction and then an elongated sequence in which the use of negative, inverted, superimposed, and otherwise unstable images serves to dissolve the figure of Tuco running back and forth among a field of grave markers. Death seems to be inscribed in the very images, as the body and face are disfigured, robbed of their power to orchestrate cinematic space.

19   Bonitzer, 'Deframing', p. 199.
20   Branigan, *Projecting a Camera,* p. 143.
21   Ibid., p. 199.

Thus, both face and frame are refigured, multiplied, and dissolved via a process of cinematic collage. As in *Outer Space*, the face is confronted not only with off-screen (diegetic) space but also off-frame (abstract) space. It is at once flattened and multiplied, as the space beyond the frame seems somehow to infiltrate the image, causing a fracturing of both frame and face. In one arresting moment in *Outer Space*, Hershey's face is multiplied across different instants, so that we see one face turning *into* the space occupied by the next one, and so forth. Thus, dislocating the face in time paradoxically endows it with additional volume (in this sense, Tscherkassky's approach both borrows and diverges from the de-dimensionalizing techniques of cubist art). Similarly, in *Instructions for a Light and Sound Machine*, we are conscious that the faces we see are imprinted on flat celluloid, but the surplus spatial movements of the damaged frames appear to suggest the intervention of forces occupying three-dimensional space (whether the mechanism of the camera and projector, or the less clearly defined 'outside' of the frame). In this way, Tscherkassky's work reminds us of the two-dimensional flatness of the frame and its material limits (and hence its remoteness from the spatial plenitude of the profilmic scene) but also, in refiguring the frame, succeeds in conjuring up depth-oriented spatial relations beyond it: here, space returns with a vengeance. Although Tscherkassky's exploration of the celluloid frame aggressively foregrounds analogue materiality, his attention to cinematic space is nonetheless echoed in certain digitally based remix works, such as the one I will discuss in the following section.

The Transfigured Frame

Gregg Biermann's film *Spherical Coordinates* (2005) pursues a completely different approach in order to explore the limits of the frame and the face. The film recycles a short sequence from *Psycho* (Alfred Hitchcock, 1960) in which the character of Marion (Janet Leigh), who has stolen money from her employer, drives through a rural landscape and into a city, and is briefly pulled over by a policeman along the way. However, this familiar scene is subjected to an extraordinary transformation, taking it far from its celluloid origins. Using digital software, Biermann 'projects' the original sequence into a virtual sphere, distorting the image to the point where the edges of the original frame curl around to meet each other. That is, although the image we see is technically two-dimensional, it appears to be stretched across a curved, concave surface. Using a virtual 'camera', Biermann then pans across the surface of this curved image. The frame is thus revealed

8. Still from *Spherical Coordinates*, Gregg Biermann, 2005. 04:00. Courtesy of the artist.

as a fragment, but one that is folded into a self-referential totality. Here, the face's place within this radically distended frame, as well as its role as an element in traditional shot-reverse shot structure, is uncertain. The virtual camera movements that pan across the surface of the sphere turn the face on its head, pushing it to the edge of the frame and making it balloon comically. In the process, the conventional relationship between face and space (involving the careful juxtaposition of the reaction shot and the spatial environment) is overturned, as each is folded into the other.

Here, the face is neither fragmented nor multiplied. Instead, it is transfigured, becoming coterminous with its surroundings. In *Spherical Coordinates*, there is no face, and everything is face. The conventional figuration of the face collapses as figure and ground become equivalent. In the process, screen spatiality is compressed and flattened. The planar ontology of the source images is foregrounded, along with the illusory depth of their digital reincarnation: instead of a face standing out against a backdrop, we see a two-dimensional plane projected across a virtual surface. Indeed, the film's invocation of geometrical coordinates suggests not only the curvature of that surface but also its digital mapping.

At the same time, the constant movement of the virtual camera suggests the orientation of a POV shot, looking from within the car (and hence

aligns with Marion's fearful, paranoid glances at the space outside). This is supported by the distortion of the images, which makes space appear concave. From one perspective, the filmic material is organ-ized in the form of a giant eyeball, which scans anxiously across its environment. The black circles that mark the top and bottom of the wraparound frame might thus serve either as metaphorical pupils or optical occlusions—the inescapable blind spot that haunts human vision. However, given that Marion's face, monstrously distorted, remains within the frame, we have also the sense of being on the outside of the space, looking in. We thus face inwards and outwards, as if gazing at the image from both sides. Meanwhile, the spinning of the transfigured frame emphasizes and enhances circularity, so that the face itself becomes another rotating element, along with the steering wheel, the dark circles above and below the 'frame', and, by implication, the spinning wheels of the car itself. In this way, the face and the vehicle are folded into the same loop: perception, navigation, movement, and affect all play out across curved surfaces. Indeed, even as Marion's face becomes just another object within the frame, the film's vehicular travelling shots seem increasingly facialized, as the images of cars and city streets resolve into vortices punctuated by dark holes—crude approximations of faces, in other words. These in turn seem to echo the dark glasses worn by the police officer as he peers into the car.

Such images recall Deleuze and Guattari's account of the 'abstract machine of faciality' which 'produces faces according to the changeable combinations of its cogwheels'.[22] For Deleuze and Guattari, the face is a historical construct associated with reification and control. Faciality, which imposes semiotic meaning and subjectification, is produced by the 'despotic and authoritarian concrete assemblage of power'.[23] The master metaphor for this machine is a white wall punctuated with black holes. Facialization is engendered by the 'black hole/white wall system' via a process of abstraction in which meaning and affect are locked down. Beyond its literal presentation of Marion's face, *Spherical Coordinates* produces an array of facializing effects that orient pale surfaces around black holes (the 'top' and 'bottom' of the looped frame). These effects serve to evoke notions of recognition, detection, and authority—particularly in relation to the hostile gaze of the police officer. At the same time, the rapidly swirling camera movements at the end of the film introduce a further transformation in which Marion's distorted face appears to fold into its surroundings. The mobility and reversibility of these

22   Deleuze and Guattari, *A Thousand Plateaus*, p. 168.
23   Ibid., p. 181.

images means that this abstract 'face' is always flirting with 'defacialization' by dissolving into something less determinate: a space, an environment, an excrescence.[24]

Accordingly, one can also see another potential metaphor in this sequence, which gestures beyond the visible body, foreshadowing the infamous shower scene and its aftermath. Specifically, the turning of the image around a dark circle recalls the close-up of water, mixed with blood, draining down the plughole at the Bates Motel. This effect is further enhanced by the swirling, heavily processed dialogue that accompanies Biermann's film. Biermann's manipulation of sound and image amplifies the embedded significance of this intermediate scene, reframing Marion's anxiety regarding her guilty past as a premonition of her future doom. The incessant movement of *Spherical Coordinates* thus recalls Bonitzer's notion of deframing in two senses: in visual terms, it pushes the human form to the limits of the frame, dehumanizing it; and in narrative terms, it foreshadows the emptying out of the original film's sympathetic investment, as the protagonist's life goes figuratively down the plughole. Yet, in keeping with the circular logic of *Spherical Coordinates*, this visual metaphor leads not simply into defacialization; it also serves to lead us back to the face via another route. In Hitchcock's *Psycho*, the image of the plughole dissolves to an extreme close-up of Marion's lifeless eye. The shot pulls back to place the eye in the context of Marion's face, emptied of expression. The circuit of the drain leading to the eye leading to the face is a crucial moment in Hitchcock's film, and Biermann's orchestration of eye, face, and environment gestures obliquely but unmistakeably towards it. Once again, the 'abstract machine' of faciality reasserts itself as we move back and forth between facialized spaces and spatialized faces.

Finally, we might suggest another twist in Biermann's playful détournement of face and frame, via the concept of interface. Slavoj Žižek uses this term to refer to the blending of subjective and objective shots within the same frame, by way of reflections, superimpositions, or other types of composite images.[25] He suggests that such interfaces produce a 'spectral dimension', via which repressed elements (whether textual, ideological, or pathological) are brought to the surface.[26] Žižek cites examples from Kieslowski's *Blue* (1993), in which an approaching figure is reflected in the protagonist's eye, and *The Double Life of Véronique* (1991), in which Véronique's

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24   Ibid., p. 190.
25   Žižek, p. 39.
26   Ibid., p. 53.

psychological state is evoked via the anamorphic distortions created by a train window and a glass ball.[27] What has been excluded from the frame thus returns via the interface, as the shot is haunted by its reverse shot. The sequence sampled by Biermann contains just such an interface in the form of Marion's rear-view mirror, where the figure of the following patrolman is clearly visible.[28] Despite being extracted from its original narrative context and placed against a giddily spinning backdrop, the internal frame of the rear-view mirror is nonetheless successful in indexing Marion's sense of anxiety. Regarded in its entirety, *Spherical Coordinates* might also be viewed, like the motif of the glass orb in *The Double Life of Véronique* and *Citizen Kane* (Orson Welles, 1941), as an anamorphic interface that reflects and magnifies *Psycho*'s circuit of guilt, repression, and punishment.

Yet Biermann's recycling of the film fragment leads not only towards the Žižekian notion of interface, with its hermeneutic implications, but also towards the notion of a purely *digital* interface, which reflects in turn on questions of mediatic transfiguration. Eivind Røssaak, in his analysis of the 'algorithmic turn' in post-cinematic media culture, singles out Biermann's work as '"software cinema" because it so insistently explores a found sequence of film images according to a preprogrammed software feature or "special effect"'.[29] In *Spherical Coordinates*, he writes, 'It is as if a camera is analyzing the manipulation of the image itself'.[30] The image is thus rendered as a kind of interface, which both indexes and conceals the algorithmic processes underpinning it. In this context, the face is both central and peripheral. The image-as-interface operates according to a dynamic of facing (defined by subject-object interaction) that parallels but differs from the other gestures of facing represented within the film itself (facing the mirror, facing the road, facing the camera). It suggests a zone of interventions and encounters, a surface for touching as well as looking. By investing Hitchcock's familiar images with the illusion of volume and traversing them with a virtual 'camera movement', Biermann renders the image as a control surface while underlying the gap between the image-as-interface and the underlying mutability of its digital code. The plastic, tactile quality of *Spherical Coordinates* thus evokes the 'hands-on' manipulation of the image, transforming perspectival space (and the face as one of its key

27   Ibid., p. 52, 50.
28   This embedded frame, as Kaja Silverman points out, signals Marion as 'doubly inscribed' by the law, since the image of the pursuing cop appears both in the frontal shot of Marion and in the reverse shot of the mirror (Silverman, *The Subject of Semiotics*, p. 209).
29   Røssaak, 'Algorithmic Culture', pp. 195-196.
30   Ibid., p. 197.

elements) into interfacial space, where the relationship between flatness and depth is endlessly negotiable.

Like *Instructions for a Light and Sound Machine*, *Spherical Coordinates* encourages both cinephilic and analytic engagements with its sampled text and probes the relationship between two- and three-dimensionality. Creating a push and pull between face and frame, Biermann's film flattens and opens out cinematic space, as if inviting viewers to inhabit the images, to view them from the other side. Yet rather than breaking up face and frame, *Spherical Coordinates* treats the frame-as-fragment as the basis for a virtual totality. The incessant re-cycling of the image leads both towards the fantasmatic (the world of Marion's character in *Psycho*, her guilty past and tragic future)—and also out of it, towards the algorithmic. Via a singular type of spatial collage, Biermann juxtaposes the film frame with itself, making visible its two-dimensional boundaries while projecting it into an alternative, three-dimensional virtual space. In the process, other boundaries (the boundaries dividing figure from ground and face from not-face) are drawn into question. Upturning classical cinema's compositional logic, *Spherical Coordinates* reads the cinematic face in and through its spatial surroundings, causing dizzying movements into and through the image. The face and the act of facing are both transfigured as the sampled sequence becomes a world in its own right.

The Configured Frame

My next example draws upon more conventional means but achieves equally dizzying results through a logic not of disfiguration or transfiguration but one of configuration. Nicolas Provost's film *Gravity* (2007) is a work of montage, based upon the rapid intercutting of found footage. Yet while Provost, unlike Tscherkassky and Biermann, does not intervene within the frame itself, the speed of oscillation between images produces illusory spatial effects, exposing invisible seams within the frame. The source material for *Gravity* betrays the film's cinephilic dimension: it involves a series of fraught romantic encounters drawn from a range of iconic *auteur* films including *Vertigo* (Alfred Hitchcock, 1958)*, Hiroshima mon amour* (Alain Resnais, 1959), and *Blue Velvet* (David Lynch, 1986). Cross-cutting between scenes from these films at an extremely rapid rate, Provost synchronizes the characters' actions of approaching, embracing, and kissing so that the movements take on an uncanny, flickering consistency. They are both continuous and supremely disjunctive.

The face is central to this diachronic articulation, because Provost places heads and faces from different films close enough to suggest an ongoing chain of graphic matches. Filmic fragments collide, and the figurative anchor of the face helps to bind them together. But *Gravity* also, through temporal fragmentation, blends and blurs the functions of face, body, and frame, both revealing and exaggerating the way that each can, in a narrative context, serve as a stand-in for the others. Through a telescoping effect, the frame is reduced to the body, which is reduced to the face. Here, looks and counterlooks across different films link unrelated bodies and incommensurable spaces, as frame faces frame. *Gravity's* facial logic is thus dynamic and transitive, deploying *'face'* not only as noun but also as verb. Catherine Fowler has commented on the significance of physical gesture in found-footage video works such as Christian Marclay's *The Clock* (2011), arguing that it is not facial expressivity but bodily movement that animates them. Writes Fowler, 'these artists grasp and seize gestures, observing how they mediate between the film's past and the viewer's present'.[31] Yet the spatial dynamics of *Gravity* suggest a blurring of any firm distinction between face and gesture. For this is also a film about the act of facing, a fact that is underlined by the alignment of dynamic movements, in particular by the action of characters turning to embrace and kiss each other. The role of the cinematic face, *Gravity* reminds us, is to face and be faced.

At the same time, *Gravity's* orchestration of facing eventually directs the performers' faces *away* from the camera as they collectively orient themselves towards the privileged moment of the kiss. Steven Jacobs, in his analysis of *Gravity*, links the cinematic kiss with stillness and closure: 'A favourite motif for stills, a kiss scene implies the transformation from film to photograph, from movement to stasis.'[32] Yet as Jacobs also observes, Provost's montage draws substantially upon Hitchcock's staging of kiss scenes, 'which involve actors turning in the manner of a waltz'.[33] Thus, by linking together a chain of these cinematic moments, Provost maintains a kinetic momentum, drawing out the gestural movement of the kiss. The extended action of the kiss also works as a figure at the textual level. *Gravity* stages a promiscuous frenzy of the cinematic, via which different films and film moments come into erotic contact. It is not only faces but also frames that touch each other in *Gravity*. Throughout the remainder of the film, Provost allows his human figures (the recognizable stars of classic films)

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31   Fowler, '*The Clock*', p. 239.
32   Jacobs, *Framing Pictures*, p. 164.
33   Ibid.

to separate and embrace again, in a choreographed negotiation between intimacy and distance, a series of facial exposures and occlusions.

In this respect, *Gravity* recalls Les LeVeque's much-discussed film *2 Spellbound* (1999), which accelerates Hitchcock's *Spellbound* (1945) to breakneck speed and alternates the horizontal orientation of selected frames, producing symmetrical superimpositions. The mirroring of these superimpositions and their resemblance to Rorschach blots references '*Spellbound*'s narrative concerns with psychoanalysis'.[34] However, as Sharon Tay and Patricia Zimmerman argue, the systematic 'algorithmic' technique used to extract and modify the footage simultaneously renders the image as 'interface' and frees desire from 'psychoanalytic codifications': in *2 Spellbound*, 'desire is in the machine, not the image'.[35] The abstract patterns that emerge from these algorithmic processes 'underscore the image as a spatialized zone'.[36] Within this zone, I suggest, new space-face possibilities present themselves. As characters lean in to kiss each other, the flickering reversals render them as mirrored ghosts who are simultaneously kissing themselves. Throughout the film, faces tend to overlap with and inhabit other faces, blurring identity and spatial autonomy. Arguably, *2 Spellbound*'s clone-faces are synecdochic for the film itself, figures of its mirrored configuration.

In a less obvious way, *Gravity*'s underlying logic is also algorithmic. Although it resembles conventional montage, the editing appears determined by a schematic pattern of alternation. This pattern changes speed at key moments but maintains a regulated, metronomic rhythm. The film thus resembles a database of video clips fed into a rule-based system, although it is clear that these clips have been carefully synchronized to produce spatial effects. *Gravity*'s aesthetic thus exists somewhere between the precise temporal orchestration of montage and the automated logic of the algorithm. The key difference between *2 Spellbound* and *Gravity* lies in Provost's more deliberate use of editing to produce spatial depth. In *2 Spellbound*, the acceleration and symmetrical arrangement of the images compresses the frame, while *Gravity*'s disorienting effect depends on a more ambiguous oscillation between flatness and depth. The use of shot-reverse shot conventions and the repetition of pivoting movements open up cinematic space, even as the juxtaposition of non-contiguous locations threatens to close it down.

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34   Sprengler, *Hitchcock and Contemporary Art*, p. 93.
35   Tay and Zimmerman, 'Throbs and Pulsations', p. 13.
36   Ibid., p. 15.

In this uncertain dimensional field, the film is held together by the viewer's attempt to read the 'figure' (both face and body) across disparate spaces. If 2 *Spellbound* treats spaces and bodies as contingent details, raw material to be processed along with the frame itself, *Gravity* keeps the human figure at the centre of its spatial operations. The movement of facing can be regarded in its own right as a type of figure, a sensible and recognizable form unfolding in time. Yet this figurative movement also has an abstract dimension, tracing a dynamic line that leads to the interchangeability of bodies, faces, and spaces. Characters oscillate between self and other, male and female, colour and monochrome. Grasping the form and identity of these figures is an ongoing challenge for the viewer.

Furthermore, the spatial integrity of the frame is constantly undermined. Although Provost does not modify individual frames, the quick oscillation between shots produces new seams and splices within the image as visual elements appear to traverse the boundary of the edit, 'jumping across' from one frame to another. We are witness to a kind of illusory collage taking place inside the frame. In one example, a character from *Hiroshima mon amour* apparently reaches out to caress a character from *Blue Velvet*; in another, the luminous pulse of Kim Novak in *Vertigo* alternates with the luminous pulse of a lamp in another film, so that together they seem to traverse cinematic space and time.

This dynamic movement of faces, facing, and intercutting places 2D and 3D space in tension, and thus parallels Tscherkassky and Biermann's films, which use different techniques to similar ends. On the one hand, the interpolation of images from different films underlines the flatness of the image, since the illusion of a consistent three-dimensional field of action is eroded. On the other, the graphic alignment of different faces, bodies, and objects, and the hypnotic tracking movements around them, cause them to stand out from the backdrop and produce new spatial configurations defined by the impression of virtual depth. Space thus seems to have been simultaneously expanded and compressed. Here, the face as figure is central to the effect of the film—it is a pivot around which the film orchestrates different spaces, shots, and frames. *Gravity* thus depends upon a logic of configuration, of figuring *with*, in which the juxtaposition of faces and frames produces striking spatial transformations.

A very different logic of configuration shapes Gregg Biermann's *Magic Mirror Maze* (2012). In this case, the juxtaposition of frames is primarily spatial rather than temporal, as the climactic 'hall of mirrors' scene from Orson Welles' *The Lady from Shanghai* (1947) is replicated across multiple

9. Still from *Magic Mirror Maze,* Gregg Biermann, 2012. 05:00. Courtesy of the artist.

frames within the frame. These are initially laid out in a three-by-four grid. Later in the film, this format is varied, and the frames are arranged in two-by-three or two-by-two formations, with each strip of frames offset either horizontally or vertically from its immediate neighbours. Added to these frames are, of course, the frames constituted by the mirrors depicted in the source film. This arrangement of frames within frames generates both formal and spatial confusion, as it is sometimes difficult to tell whether the divisions are internal or external to any given image. In Welles's film, the mirroring of faces and figures across the screen emblematizes the deceptiveness of the characters and their milieu. Biermann's algorithmic multiplication of this framing effect projects this deceptiveness into the material form of the digital image. When the *femme fatale* and her estranged husband open fire, the cascades of shattering glass evoke not only the collapse of the protagonist's world but also the disintegration of the image into its component pixels.

*Magic Mirror Maze'*s distinctive effect depends on the intermingling of frames and the resulting push-and-pull between different spatial systems. As in *Spherical Coordinates*, two types of interface can be identified here. In this case, these comprise the original film's Žižekian mirror-interface, which reflects the characters' own duplicitousness and returns it to them as a collapse of subjectivity, as well as Biermann's supplementary window-interface, which duplicates the frame and distributes it across the screen's visual field. In the latter sense*, Magic Mirror Maze* points towards the contemporary dominance of what Anne Friedberg, discussing the layered 'windows' of the computer interface, describes as a 'post-perspectival' visual

regime.[37] In the 'windowed' environment of the digital screen, there is no necessary spatial relation between frames, nor any assumption that any given frame will open into a representation of three-dimensional space.

The digital-interface effect of Biermann's film flattens out the already compromised space of the 'hall of mirrors' scene, diminishing its sense of representational volume. Yet depth is not banished altogether. Biermann introduces his own artifical sense of depth at certain points by juxtaposing shots of different scales in different frames. In a sequence towards the beginning of the film, for instance, a number of facial close-ups are interspersed with long shots showing an array of reflected figures. Here, proximity and distance are arrayed across the visual field and modulated in complex ways, as the close-ups are brought to the centre of the master frame or distributed around its edges. Biermann also selectively inverts frames along their horizontal axis, setting up new dynamics of facing and looking between frames. At one point, a close-up of Rita Hayworth's face occupies selected frames, her eyes tilted slightly upwards, so that she seems almost to be gazing up (or down) at her transposed counterpart. Furthermore, under the pressure of the film's dynamic spatial inversions and temporal delays, the frame boundaries become zones of indeterminacy, across which bodies appear to become fused with their mirror counterparts. At one point, Rita Hayworth's eye, situated in the centre of each frame, becomes the pivot around which the images flip. Here, the face wavers precariously between figuration and abstraction. The spatial reconfiguration of frames thus produces both two-dimensional and three-dimensional effects, prompting a kind of ontological hesitation between the topologies of the mirror, the frame, and the digital interface.

Conclusion

Biermann and Provost's films thus illuminate cinema's new spatial coordinates in the era of the algorithm and the interface, as both face and frame are folded into the post-perspectival regime of the digital screen. These works are aligned with 'the new cinephilia of the download, the file swap, the sampling, re-editing and re-mounting of story line, characters, and genre'.[38] Yet the other side of this contemporary cinephilia arguably involves a return to the technologies and settings of analogue cinema, as

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37   Friedberg, *The Virtual Window*, p. 194.
38   Elsaesser, 'Cinephilia', p. 40.

exemplified by Tscherkassky's attachment to celluloid materiality and to the Cinemascope format. Here, spaces and faces are no less emphatically unhinged from their original contexts, as Tscherkassky constructs a post-perspectival aesthetic based purely on the film strip and its relationship with light. Despite utilizing very different technologies and techniques, then, these various works display striking parallels. Regarded collectively, they represent a remarkable alignment of aesthetic practices and conceptual implications at the conjunction of analogue and digital cinephilia. By disarticulating recognizable cinematic faces from their narrative and scenic contexts, these films render them as fragments, allowing viewers to encounter familiar images in unfamiliar alignments and enabling new articulations in flatness and depth. They operate by disfiguring the face, by multiplying it across the frame, by transfiguring and distorting it, or by placing it into new configurations with other framed faces and spaces.

Such works thus recall Barthes' distinction between figuration and representation. For Barthes, figuration describes 'the way in which the erotic body appears (to whatever degree and in whatever form that may be) in the profile of the text [...]'.[39] Representation, by contrast, is 'embarrassed figuration', in which relations of desire are contained within fictional or represented worlds.[40] The notion of boundedness is crucial to Barthes' distinction: representation is 'when nothing emerges, when nothing leaps out of the frame: of the picture, the book, the screen'.[41] The project of the films I discuss here is to *re-figure* the face and its spatial relationships. These works transform the framed spaces of narrative cinema and also face beyond them, opening the frame into abstract spaces that oscillate between flatness and depth. The implications of this oscillation are both experiential and critical: on the one hand, it allows viewers to reinhabit familiar cinematic worlds, as if stepping across a dimensional threshold; on the other, it encourages them to consider how cinema apprehends and articulates space.

Although found-footage films often display refigurations of cinematic space, these particular works' intensive focus on the face gives such refigurations a conceptual and aesthetic twist, foregrounding the face's importance as a point of spatial articulation. As film theoretical debates indicate, the cinematic face can produce dimensional ambiguity through its capacity to open up spatial relations (in the shot/reverse shot, for example) and

39   Barthes, *The Pleasure of the Text,* pp. 55-56.
40   Ibid., p. 56.
41   Ibid., p. 57.

to collapse them (in the close-up). Playing on this ambiguity, these films frame the face not just as a marker of identity, or site of affect, but as a spatiotemporal function. The face, these works remind us, *faces*. By teasing apart and rearranging the relationship between cinematic faces and spaces, they turn cinema back on itself, bringing it face to face with its own complex dimensional ambiguity.

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6. Looking Up, Looking Down: A New Vision in Motion

Jennifer Pranolo

Abstract

This article traces a genealogy of what it means to 'see' photographically. Turning to the eye exercises and perspective games of the educator László Moholy-Nagy, the psychologist Adelbert Ames, Jr., and the artist Elad Lassry, it focuses on the human body as a site of instability in exposing the hidden potentialities of photographic space. The camera and the photograph are not used to replicate a pre-existing vision of reality but to explore the visual and cognitive terrain of a new spatial logic. By examining how bodies are organized within and by the picture, it argues that the synthetic topologies of photographic seeing can proprioceptively reorient viewers to the heightened ambiguities of the digital screen as photographic and computational space intersect.

Keywords: photography, perspective, proprioception, anamorphosis, topology, digital aesthetics

In Elad Lassry's brief, nine-minute film *Untitled* (2008), four actors—three women and one man—'play' with a blue-and-yellow *trompe l'oeil* house painted on a white backdrop. The figures manoeuvre awkwardly around the coloured lines and graphic edges of this bright, box-like structure. One woman stands just outside a doorway; another repeatedly tries, and fails, to rest her arm on the windowsill; the man strains to keep his body within the building's imaginary threshold; or, in a group portrait, they all sit together, their feet dangling off its illusory roof. The camera, instead of tracking their movements, remains stationary over the course of a dozen frontal, establishing shots. Stiffly holding their poses, the actors may falter in their respective positions, but the picture frame that encloses them, along

with the cartoonishly flat space that they inhabit, does not. This tension between the mobile figures and their conspicuously immobile ground creates a hallucinatory effect: we watch as the supposedly fixed contents of a seemingly static photograph subtly, almost imperceptibly, begin to shift and waver before our eyes.

Modeling *Untitled* after a series of photographs found in a 1971 science textbook, the Los Angeles-based Lassry (b. 1977)—best known for his own studio still-life photographs of uncanny objects and cleverly staged perceptual glitches—sets in motion a sequence of still images originally intended to illustrate the camera's ability to 'trick' the human eye. Yet Lassry reenacts this lesson in 'forced perspective' for quite a different purpose. By transferring the exercise to film, he is able to draw heightened attention to the presence of the human figure as a vital point of identification for how we, as viewers, often come to experience 'motion' as a powerful disorientation of our embodied sense of space in relation to the picture—and, in this case, the picture as a screen. For the actors in Lassry's film do not simply switch positions from one shot to the next, their bodies somehow appear to alter their dimensions during this surreally elongated play in perspective. They advance and retreat from foreground to background, top to bottom, wandering from left to right across the frame. At once tiny and gigantic, they shrink and stretch like living paper doll cutouts. Through their sudden changes in size and scale, the very space within the picture morphs into an uncertain construct. Where exactly is the solid ground upon which these oddly volatile figures—or the camera, or we ourselves—can be said to stand?

Starting here with Lassry—and returning later to delve further into the curious slippages in his work—in what follows I offer a detour through some other instructive perspective games and eye exercises in which the human body is deployed as a site of instability in order to challenge conventional notions about how photographic space operates naturalistically, for example, as a 'mirror' or 'window' onto the world.[1] In interviews commenting on the optical tricks scattered throughout his practice, Lassry has insisted that his

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1   The metaphor of the photograph as a 'mirror' or 'window' can be attributed to many sources, from the Albertian model of the picture as an 'open window' and Oliver Wendell Holmes' oft-cited description of the photograph as a 'mirror with a memory' in his 1859 text, 'The Stereoscope and the Stereograph' to curator John Szarkowski's influential 1978 show 'Mirrors and Windows: American Photography since 1960' at the Museum of Modern Art in New York, NY. Whether as an expression of the photographer's subjective choice of framing or as a record of a fleeting reality, the photograph in these accounts either reflexively bounces back or directly opens onto the spaces that it captures. Rendered rhetorically 'transparent' in this way, its surface is understood as something to 'see through'.

photographs are not merely representations of the scene before the camera but, more polemically, 'tools that teach', facilitating a 'coming to terms with seeing'.[2] Likewise, for the artist and educator László Moholy-Nagy (1895-1946) and the early 20th-century psychologist and ophthalmologist Adelbert Ames, Jr. (1880-1955)—the creator of the celebrated optical illusion of the Ames room—the camera as a machine of 'perfect' perspective and the photograph as the picture that it produces were not tools for replicating a preexisting vision of reality.[3] Rather, they are re-tooled to guide viewers through the uniquely *ambiguous* space that emerges to our perception through the photograph: one that vacillates between the two-dimensional and the three-dimensional, flatness and depth. In his pioneering philosophy of a 'New Vision', Moholy-Nagy presciently expressed sentiments similar to Lassry's. He saw the photograph as an infinitely resourceful tool for pushing viewers to explore the visual and cognitive terrain of a new spatial logic. By traversing these hidden potentialities of photographic space, Moholy-Nagy believed that we might not just reach a 'coming to terms with seeing' but also learn to 'see the world with entirely different eyes'.[4]

This essay looks back towards Moholy-Nagy's call for a New Vision to consider what such a strong imperative to see anew means for us today. Our understanding of the limits and conditions of photographic space once again requires revision as the intensification of digital technology—and with it, the virtual layers and informational flows of the computer screen's dynamic interface—becomes the encroaching 'ground' for the medium's widespread mode of production and display. The present discussion will focus on the role of the human body—our own and those located within the picture—in negotiating these increasingly novel spatial possibilities. From Lassry's post-'Pictures Generation' work to the techno-utopian rhetoric of Moholy-Nagy's modernist photography to the life-sized illusion of the Ames room—these historically and aesthetically disparate case studies inter-sect in their common use of the body as a pivot point for proprioceptively

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2   Lassry, 'Interview with Ryan Trecartin', pp. 140-144.

3   See Galassi, *Before Photography*, pp. 511-526. and Snyder, 'Picturing Vision', pp. 511-526. Galassi sums up photography as the 'epitome of realism' and its invention as 'nothing more than a means for automatically producing a picture in perfect perspective' (p. 512). In a critique of the medium as this 'tool of perfect perspective', Joel Snyder argues that we should not equate the realism facilitated by photography with the real itself: 'Cameras do not provide scientific corroboration of the schemata or rules invented by painters to make realistic pictures. On the contrary, cameras represent the incorporation of those schemata into a tool designed and built, with great difficulty and over a long period of time, to aid painters and draughtsmen in the production of certain kinds of pictures' (p. 511).

4   Moholy-Nagy, *Painting, Photography, Film*, p. 29.

introducing viewers to the spatial paradoxes that can proliferate within the photograph. Examining the particular ways that bodies are organized within and by the picture, I uncover a genealogy of photographic space that is ambiguous and synthetic rather than self-evident or realist. The term 'proprioception' (from the Latin *proprius*, meaning 'one's own', and *capere*, 'to take' or 'to grasp') designates those internal faculties of our nervous systems that govern our awareness of the relative position, movement, and speed of our bodies in space. While proprioception does not only, or necessarily, depend on vision, I argue that we 'see the world with entirely different eyes' precisely through our proprioceptive adaptation to the unfamiliar topologies that the photograph can generate. The New Vision *as* a 'vision in motion' turns on this transformation of our seeing into a fully kinesthetic act. We discover new positions from which to see and, finally, reconceive of our place in the world through the bodily encounter with the unpredictable configurations of photographic space.

In a series of black-and-white photographs taken during the late 1920s at the Bauhaus in Dessau, Germany, Moholy-Nagy orchestrated his own hide-and-seek games of perspective meant to puzzle and disorient the viewer. Unlike Lassry's film, however, these games were staged on the real-life set of the iconic art school's stacked balconies and gridded glass facades. As with many of his peers in the post-WWI European avant-garde, Moholy-Nagy took advantage of the recent innovation of the portable, hand-held camera to document the accelerating sensory traffic of an industrial urban modernity. He ventured out with his lightweight Leica I to pursue unorthodox vantage points previously inaccessible to the large-format, baseboard camera with its bulky equipment and constrictive movements that had characterized the medium's earlier decades. Exercising a physical boldness that matched the camera eye's newfound mobility, Moholy-Nagy sought to capture 'the view from below, from above, the oblique view'. Caught in mid-air looking up or down from unprecedented angles, the contortions of such views, he declared, would 'often disconcert viewers who take them to be accidental shots'.[5]
    The one or two human subjects present in these off-kilter snapshots are no more stably situated. Mimicking the stance of the photographer, they either glance down from a great height or glimpse upward from below. Peeking and peering at each other and at Moholy-Nagy, they interact with the blocky modernist structures around them like adventurous children climbing an enormous architectural jungle gym. In one image, a lone man,

5   Ibid., p. 28.

10. László Moholy-Nagy, *Untitled*, c. 1926-8.

installed on a precarious pinnacle, throws an arm and a leg over the corner of a railing as if he is about to jump or fly off. Moholy-Nagy dramatically skews his camera from the ground up so that the man is balanced at the apex of what appear to be tiers of steel and cement soaring into the sky. In yet another image, two women are positioned on separate floors of a Dessau master-house. One lies on the ledge of a lower terrace as she looks up at a second woman leaning over an upper balcony with her back turned

to Moholy-Nagy who, somewhere still higher up, completes this zigzag of staggered bodies and gazes. In these photographs largely composed of shadowy planes and slashing diagonals, the human figures anchor our sense of scale and distance. But their irregular placement in the space of the picture—tilted this way and that, with their partially obscured bodies never facing forward nor securely settled on a horizontal-vertical axis—elicits a momentary vertigo. We, too, must struggle to get our bearings as we figure out where to align our point of view.

For contemporary viewers, Moholy-Nagy's photographs likely seem quaint, so recognizable by now are the modernist tropes of defamiliarization, abstraction, and the fragmentation of perspective into multiple, simultaneous points of view. Indeed, throughout his prolific writings—collected in his three books *Painting, Photography, Film* (1925), *The New Vision* (1938), and the posthumous *Vision in Motion* (1947)—Moholy-Nagy enthusiastically embraced the influence of Cubism, Constructivism, Futurism, and other artistic movements of the time. Inspired by their vanguard formal strategies, he developed his programme for a New Vision, a term he coined to encompass his experiments in sculpture, theatrical design, lens-less photograms and photo-collage, in addition to his camera-based photography. Moholy-Nagy's objective was to usher in a 'new viewpoint in the visual arts [that] is a natural consequence of this age of speed which has to consider the moving eye'.[6] Modern viewers, he wrote, see 'persons and things in quick succession, in permanent motion'.[7] The ambition of the New Vision was to galvanize viewers towards an 'ocular gymnastics' aimed at reconditioning 'our optical organ of perception, the eye, and our centre of perception, the brain'.[8] Much like the acrobatic arrangement of human figures in his photographs, this cultivation of a 'moving eye' did not rely on the literal mobility of the image but rather, in a radical disruption of the prevailing optic, on prompting viewers to see the space *inside* of the picture differently.

In this respect, the renewal of vision advanced by Moholy-Nagy was as much about unlearning certain ways of seeing as it was about inciting new ones. The first task was to dismantle the paradigm of one-point, linear perspective inherited from the tradition of Renaissance painting. Moholy-Nagy claimed that this outdated model of picture-making and looking had been indelibly 'stamped upon our vision'.[9] The invention of the camera in the 19th

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6   László Moholy-Nagy, *Vision in Motion*, p. 246.

7   Ibid., p. 113.

8   László Moholy-Nagy, *Painting, Photography, Film*, p. 43.

9   Ibid., p. 28.

century, moreover, with its synthesis of the principles of linear perspective and the *camera obscura*, only strengthened its imprint on our habits of seeing. But, as Erwin Panofsky reminds us in his landmark *Perspective as Symbolic Form*, it is important to remember that the artificial viewpoint created by linear perspective is in no way the 'mirror' for our seeing that it is popularly thought to be. As a mathematical formula for rationalizing space, it is a calculated distortion of our sight as well as our sense of space. Hubert Damisch elaborates on this point by tracing the origins of perspective to a technique of architectural draftsmanship, chiefly devised to establish the illusion of three-dimensional depth on a two-dimensional surface. Famously applying these rules to painting, Leon Battista Alberti instituted perspective as the underlying backdrop for the genre of story painting or *istoria*. The basic geometry of perspective—with its reticular grid of parallel lines converging at a single vanishing point on the horizon—became the standard method for holding down the field of representation in support of a naturalistic realism.[10] It is this conception of pictorial space as a 'setting for sentimental naturalism'[11]—canonized by painting and reinforced by photography—that Moholy-Nagy so vehemently opposed.

Seen in this light, the deliberate dynamism of Moholy-Nagy's pictures attempted to counteract the longstanding codes of linear perspective. And yet, from an architectural to a painterly frame—and, as I will address, a photographic one—perspective itself takes on a decisively body-centreed emphasis. Besides generating the illusion of depth, it is primarily employed as an indispensable if invisible staging device. For Alberti, it was mainly a preliminary exercise to prepare the ground for sketching out the size, proportion, and distance between human figures in space. Remarking on the desirable features of the *istoria*, for instance, he encouraged painters above all to master the 'movement of change of place' within a picture, so that 'some bodies are placed towards us, others away from us [...] some drawn back, others high and others low'.[12] This meticulous choreography of bodies in varying states of gesture and motion necessitated perspective's systematic organization of pictorial space, mapping out a gridded guideline for their arrangement. With its assimilation into painting, which, as Damisch observes, was 'less interested in space itself than the bodies it contained', perspective was

10   See Panofsky, *Perspective as Symbolic Form*; Damisch, *The Origin of Perspective*; Alberti, *On Painting*.

11   Moholy-Nagy, *Vision in Motion*, p. 273.

12   Alberti, *On Painting*, p. 79.

thus formalized into an index of bodily orientation, 'equivalent to a network of spatial adverbs' indicating 'what is here, what there, and what over there'.[13] The measured distribution of bodies within this highly theatricalized scheme effectively converted the fictional space of the picture into a hypothetical extension of our own.

At this juncture I hope it is apparent why the disarrangement of bodies within Moholy-Nagy's photographs is significant. Neither he nor his subjects are ever in their 'proper' place according to the realist dictates of linear perspective, which strictly delimits the movement permitted within its geometrical bounds. For beyond putting bodies into place within the picture, the positions of bodies outside of it—namely, our bodies as viewers—are inextricable from the complex network of spatial orientation that perspective lays out. In her book *The Virtual Window: From Alberti to Microsoft*, Anne Friedberg elegantly summarizes how the viewer stands at the crux of the intricately imagined scenes of central perspective. She cites Alberti's instructions to place the vanishing point of a painting to coincide with the height of a universalized viewer, such that 'both the beholder and the painted things he sees will appear to be on the same plane'. 'In this way', Friedberg explains, 'the body of the viewer suggests a scale for the bodies in the representational confines of the painting. The human was in a central position as a spectator in front of a pictorial world but was also the measure of the world.'[14] This viewer is furthermore required to stay immobile for the perspectival illusion to be convincing. Leveling our inherently mobile and binocular way of seeing—with two eyes in a head on a moving body—perspective unilaterally reduces our vision, and the world, to the monocular 'peephole' of the vanishing point.

With his plan for a New Vision, Moholy-Nagy enlisted his body and the camera to dislodge viewers from this unmoving centre. Looking up, looking down, from side to side, he defied the camera's automatically 'correct' perspective, inserting crisscrossing horizon lines and erratic vanishing points. The displacement of human figures in his photographs—one farther, one closer, one above, one below—provides another cue to recalculate our bearings. We are not on the same plane as these figures and, like them, we are mobile. It is in this vein that Moholy-Nagy links the body to vision through the category of motion. Explicitly defining space through the body, he states that 'space is the relation between the position of bodies', and

13   Damisch, *The Origin of Perspective*, p. 6.
14   Anne Friedberg, *The Virtual Window,* pp. 33-35.

'spatial creation is the creation of relationships [between the] position of bodies'. Privileging vision in this creation of new spaces, he goes on:

> Each of our senses which can record the position of bodies allows a grasping of space. Thus space is known to man, first of all by means of his sense of vision. This experience of the visible relations of positions of bodies may be checked by movement—alteration of position [...]. From the point of view of the subject, space is naturally to be experienced most directly by movement.[15]

Without naming it as such, Moholy-Nagy describes a proprioceptive process of 'seeing' space through bodily movement. While our vision can orient us in space, it is our bodies that come to know that space by moving through it. By registering the incremental displacements of our bodies, our vision helps to control the reactions of our muscles and joints in propelling our locomotion through the world. New spaces are created by and within the picture when we find ourselves trying to move through—here cognitively rather than somatically—positions of seeing that we had not known before.

The goal of the New Vision to 'see the world with entirely differently eyes' is therefore deeply connected to this continual repositioning of our bodies in response to the picture's cognitive pull as a point of spatial orientation. Linear perspective acts like a compass that points our vision, and our bodies, in one direction. By contrast, Moholy-Nagy remakes the space of his pictures into a playground for setting our 'vision in motion' through an intensive 'gymnastics' of the eye and brain. He draws new visual and spatial lines for the viewer to follow. Yet, in his use of the camera and the photograph to 'activate' our vision, we arrive at a crossroads where painting and photography diverge. Where the positions of bodies in a painting belong to the sole discretion and skill of the artist, this is not true of the camera, with its 'objective' capacity to record an indexical image of the world.[16] How does

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15   Moholy-Nagy, *The New Vision*, p. 163. Besides sight, the other senses that Moholy-Nagy lists are a 'sense of hearing', a 'sense of equilibrium', and a 'sense of locomotion'. These three senses all fall under the heading of the vestibular system, which refers to the organs in the inner ear that regulate spatial orientation, balance, and acceleration with respect to gravity and movement. In conjunction with a sense of vision, the vestibular apparatus contributes to our overall muscle-joint sense of proprioception, although here I concentrate on the visual aspect.
16   While I have bracketed a discussion of the medium's indexicality in this essay, along with the spatial metaphors of a 'mirror' or 'window', the photograph has also been compared to a 'pencil of nature' (William Henry Fox Talbot), a trace of 'that-has-been' (Roland Barthes), or

perspective as an instrument of bodily orientation 'stage' space within the photograph? What happens to the function of perspective, and the body in perspective, in the passage between these two mediums? Damisch presents a possible answer to these questions when he posits that perspective was first 'an extension of architecture', second 'an extension of theatre', and third 'an extension of "decoration"'.[17] Perspective most clearly adopts this last guise when confronted with the real bodies and spaces before the camera. It recedes into something more like a prop, a movable article of scenery or décor. In the transition to the photograph, I contend that a distinctly ambiguous space—available to many grounds of orientation—gradually becomes detectable to the viewer.

The well-known phenomenon of the Ames room demonstrates how the peculiar ambiguity of perspective within the photograph can trouble our proprioceptive ability to locate and position ourselves in the world. The unusual behaviour of human bodies upon entering the room exposes the structural breakdown of perspective when it is utilized as an ornament of illusion instead of as a tool of realism. The room was designed in 1934 by Adelbert Ames, Jr., a polymath who invented several ingenious games of perspective. In a version of the room seen here, two women wearing complementary floral-print dresses look directly at the camera. The woman on the right appears twice as large as the woman on the left. The smaller woman casts appropriately diminutive shadows on the massive walls behind her, just as her companion casts appropriately gigantic ones against those same walls that can barely accommodate her. The low ceiling bears down on the woman on the right, whose body is turned in profile towards the woman on the left, herself turned at an angle towards the viewer. Thickly outlined on the room's walls are identical 'windows' that

a 'death mask' for time (André Bazin). Following a concept borrowed from the semiotician Charles Sanders Peirce, the photograph has been widely theorized as an 'index', or a sign with an existential connection to whatever it represents. Light 'touches' and binds the subject photographed to a chemical base, transforming this ephemeral link into a material fact. The shift from analog to digital technology has been posed by critics and scholars in terms of an ontological loss of the photograph's indexicality, since the digital camera translates light into numerical code. For a challenge to this position, see Tom Gunning's 'What's the Point of an Index? Or Faking Photographs', pp. 23-40. Gunning disentangles the 'truth claim' of the photograph from its indexical status, arguing that even before the arrival of the digital, the photograph as a document or 'proof' of the real was highly manipulable and mediated. Gunning asserts that the digital does not eliminate the photograph's indexicality, it simply stores it differently. What the digital arguably effects more is the photograph's iconicity, or the relation of resemblance between the picture and what it depicts.

17   Damisch, *The Origin of Perspective*, p. 237.
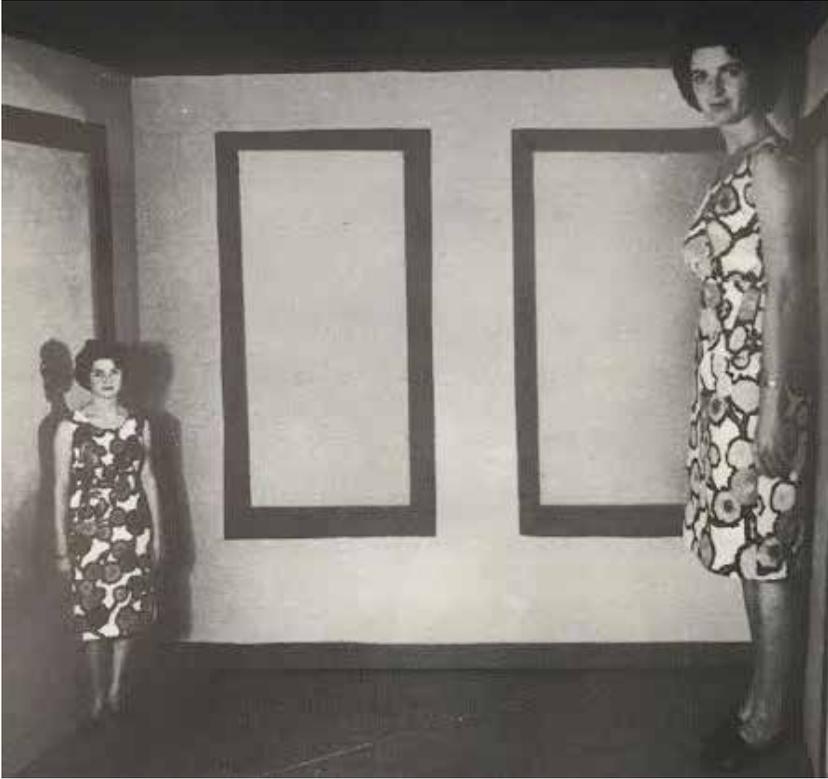
11. Illustration of 'The Ames room' from Richard L. Gregory, *Eye and Brain: The Psychology of Seeing*, 1966.

accentuate the pair's difference in size. If we were to envision the room empty, or even with one woman, it would be relatively unremarkable. But because it contains two women, so drastically disproportionate in scale, we are left to wonder how our own bodies might fit into this perplexing funhouse of a room.

A closer inspection yields a clue to the room's anomalous construction. The women are in fact at a diagonal from each other. The 'shorter' woman is positioned at the back left corner while the 'taller' woman has been pushed to the front right edge. They nonetheless appear to be on the same plane. The floor is flat, the walls are straight, and they stand calmly and vertically upright. How, then, are they taking up space in this incongruous fashion? Is it the bodies, the room, or our eyes that are deceiving us? In his classic text *Eye and Brain: The Psychology of Seeing*, Richard L. Gregory clarifies this conundrum as a misapplication of our 'common sense' experience of rooms: 'Evidently we are so used to rectangular rooms, we accept it as axiomatic

that it is the *objects* inside (the people) which are odd sizes, rather than the room being an odd shape'.[18] To the contrary, the Ames room is assembled as an unevenly distorted trapezoid. The floor recedes downwards to the left to form a backwardly canted stage. The width and height of the 'windows' narrow from left to right. The interior horizon line slopes back at an incline, sliding the vanishing point from the centre to the lower left side of the room. Like Moholy-Nagy's photograph, the women are on separate planes and at different distances from us. The smaller woman, who is farther away, is slightly below our line of sight, and the bigger woman, who is nearer to us, is slightly above it. Stationed at an aperture for one eye, the viewer stands outside looking in. We become proxies for the camera eye, flattening three-dimensional space into the illusion of two.

The Ames room reveals how startling things can become when the restrictions of linear perspective, embedded into the very mechanics of the camera, are projected onto bodies and spaces that exceed its prescribed view. This is the 'blind spot' of perspective that Ames manipulates through the technique of anamorphosis, which bends and plays with the constraints of perspective. An anamorphic picture—from the Greek *ana-*, meaning 'up' or 'back', and *morphe-*, 'to shape'—looks distorted when seen frontally but rights itself from a sideways view. The trick of the Ames room lies in its anamorphic distortion of the physical space before the camera, expanding and contracting the coordinates of a 'normal' rectangular room to fabricate an impossible reality right before our eyes. Perspective stops acting as a single point of orientation and transforms into a decorative prop that can be shifted around to stage unlikely spatial arrangements. Through this vivid illustration, the photograph unveils itself as neither a perfectly mimetic reproduction of the space in front of the camera, nor as a totally distorted view of the world that cannot be trusted. Between these two extremes, it produces a spatially ambiguous reality that fluctuates somewhere between two-dimensional flatness and three-dimensional depth. In the interstices, I argue, there arises a kind of space that we could not see, and would not even exist, without the photograph.

For Moholy-Nagy as for Ames, the pedagogical and aesthetic value of this in-between space—not fully bound nor unbound from the grounding grid of linear perspective—is what makes the photograph into an exceptionally versatile tool for mobilizing our vision in new directions. By positioning the human figure as a strategic site of instability in their pictures, they affirm that our perception of space, whether pictorial or physical, is tethered to

18   Gregory, *Eye and Brain,* p. 186.

our embodied knowledge of 'what is here, what there, and what over there' in the ongoing proprioceptive readjustment of our bodies toward other bodies and objects in the world. Ames's use of anamorphosis to carry out this perceptual exercise highlights Jonathan Crary's assertion in *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* that 'the veracity of the camera', despite its discursive status as an impartial 'eye-witness', has always been 'haunted by its proximity to techniques of conjuration and illusion'.[19] Crary persuasively shows that the vagaries of visual illusion were historically harnessed as a heuristic process—through proto-cinematic devices such as the thaumatrope, the phenakistiscope, the zoetrope, etc.—to 'train' viewers to become conscious of the inescapable corporeality and, consequently, imperfection, of our visual engagement with the world. The illusion of motion that these optical toys induced was attributed to flaws and idiosyncrasies in the physiology of the human eye. Splitting perception from the object perceived, everything we see is filtered through, in Crary's words, 'a body with an innate capacity, one might even say a transcendental faculty, to *misperceive*—an eye that renders difference equivalent'.[20]

Crary's identification of the unreliable nature of our seeing is especially relevant here because, like our bodies, our eyes and minds are in constant motion. I would counter, though, that where the photograph ostensibly 'fixes' a stable view of the world, this view has an equally inconstant nature built into it. The illusions that spring from the photograph's ambiguous space—like the Ames room's abnormal scaling of the human body—are the byproducts of our failure to conceive of the full range of spatial configurations concealed within the picture. On this discrepancy, Ernst Gombrich astutely notes that the intrinsic geometry of linear perspective suppresses this 'infinite number of related configurations', 'just as not one but an infinite number of related objects would cast the same shadow if placed in the beam emanating from a one-point source'. Looking at the picture, we know, in other words, that the vanishing point structure of perspective can create space where there is none, simulating distance via the measured diminution of bodies by position and size. But we cannot easily invert this structure, translating it back into the amorphous flux of reality, without falling into a frequent perceptual trap. As Gombrich elucidates, while a picture in perspective can signify a 'class of objects', these are not objects that 'would ever be known in our environment'. We routinely mistake 'one specimen

19   Crary, *Techniques of the Observer,* p. 33.
20   Ibid., p. 90.

of the class—the flat design on the plane in front of us—for another, the solid object over there'.[21] Following Crary, our eyes render 'equivalent' the difference between a picture of an object and the object itself. Even though we tend to 'see through' the surface of the photograph, this does not mean we can successfully extract a three-dimensional world from a two-dimensional representation. Misperceiving the 'relation between the position of bodies' in the Ames room, we stumble across a space inside of the photograph that is far more enigmatic—and ultimately indeterminable—than what it looks like from the outside.

What are some of the properties of this strange space inside of the photograph? Extending Gombrich's idea that any perspectively constructed picture harbors within it an 'infinite number of related configurations', I propose that we think of the photograph not as a two-dimensional representation of a three-dimensional world—a topography of surfaces—but as a *topology*. Topology is a field of mathematics that studies geometric objects that can be continuously transformed without losing their originary qualities. Topologically speaking, a circle is equivalent, or 'homeomorphic', to a square. The points and lines of either can be pulled or smoothed to map one onto the other. A wheel or a torus, on the other hand, which includes a hole, is not equivalent to a circle. From the point-coordinate system of a Euclidean metric space to the more elastic, point-'neighbourhood' system of a topological space, the manner by which a torus and a circle undergo changes in distance and closeness, connectedness and compactness, is essentially different.[22] I present these elementary examples here—although the nuances of a topological analysis of forms is beyond the scope of this essay—to suggest that we might approach the photograph as one such topologically malleable space. Every photograph made with a camera is a two-dimensional plane mapped by the grid of linear perspective; wherever the camera is positioned, or whatever is in front of it, each picture consists of a concrete point of view and a projected vanishing point. In the protean space between those two points, however, there exists an open set of related possibilities. The 'shape' of the photograph can be thought of as this topology of variable configurations—either found in the world, like Moholy-Nagy's 'accidental shots', or staged for the camera, like the Ames room. An infinite number of homeomorphic distortions and deformations can occur to the

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21 Gombrich, *The Image and the Eye*, p. 191.
22 See Bert Mendelson, *Introduction to Topology*. For a concise and accessible explanation of terms, see the prefaces to Chapter 2 on 'Metric Spaces' and Chapter 3 on 'Topological Spaces'; and Jeffrey R. Weeks, *The Shape of Space*.

space inside of the photograph within the parameters of those two defining points. If the geometry of linear perspective rivets our vision to a flatly homogenous space, topology loosens up our qualitative experience of this space, twisting and turning viewers around a moving centre.

Reframing the photograph as this generator of ambiguous topologies affords us more room, so to speak, in relation to it. When looking at the photograph, we can proprioceptively adapt ourselves to spatial arrangements that deviate from the typical, one-point perspective. This bodily 'seeing' can help us to imagine and materialize other ways of taking up space in the world that do not correspond to the inflexible position assigned to us by perspective. Perspective, as already mentioned, is a monocular depth cue implanted within the picture. It should not be confused with how we *perceive* depth, which is a function of how our eyes and minds integrate an incessant stream of visual information to stabilize a 'constant' picture of the shifting reality around us. This scaling for perceptual constancy guarantees, among other things, that we know that bodies stay a uniform size, even as they appear bigger as they come nearer or smaller from farther away. We labour ceaselessly, if unconsciously, to estimate the distance between people and things as they, and we, move around in space. But these same calculations cannot be applied to the people and things we see in a photograph. In our assessment of the Ames room, we overlook the fact that perspective in the picture 'sets constancy scaling *directly*'.[23] We miscalculate the distance between the position of our bodies at the viewing point and the position of the bodies arrayed around a displaced vanishing point. Illuminating the fundamental inconstancy of our vision, the optical illusion of the Ames room generates an unforeseen topological space, one that needs to be navigated differently than the preset mental template of linear perspective, which falsely imposes the illusion of a coextensive space shared by the bodies within the picture and without.

I submit that in coming to 'see' these mutable topologies nested inside the photograph, the epistemological force of illusion has a crucial cognitive effect. Gregory's insights remain a key reference on this topic of optical illusions. He maintains that in looking at two-dimensional images, there are two kinds of scaling to account for: '"*upwards*" from depth cues and "*downwards*" from seen depth'.[24] We synthesize 'upwards' from visual signals to our eyes, and 'downwards' from our store of perceptual knowledge. Conflicting cues within the picture can cause us to mismatch what we know onto what we

23   Gregory, *Eye and Brain*, p. 226
24   Ibid., p. 238.

see, engendering the cognitive 'slips' of illusion. Gregory formulates this 'bottom-up' and 'top-down' model to rectify these perceptual errors. I borrow his more 'active' understanding of perception to update Moholy-Nagy's New Vision for the digital era. The ambiguities of photographic space are becoming more and more perceptible in the crossover to the digital screen. Illusions run rife in this overlap as one medium blends into the other. Lassry's eye exercises carefully exploit the widening gap between what we see and what we know to stimulate viewers to look up and look down, stretching old pictures into a new digital shape.

When speaking about his work, Lassry—who, besides photography and film, has done dance performances and sculptural installations—consistently refers to his interest in what he calls 'nervous pictures'. 'A nervous picture', he says, 'is one that makes your faculties fail, when your comfort about having visual information, or about knowing the world, is somehow shaken'.[25] Making the bulk of his work in his East Hollywood studio, Lassry has been associated with artists like Walead Beshty, Roe Etheridge, Annette Kelm, and Eileen Quinlan, who in the last decade have been formative in revitalizing the field of contemporary art photography. In the wake of the 'Pictures Generation' legacy of the late 1970s, these artists interrogate the photograph as both a conceptual object and a heavily circulated cultural commodity. In particular, Lassry's geographic propinquity to the movie industry has supplied him with a readymade archive for appropriation: a paper trail of stock and celebrity photos, movie stills, vintage *Life* magazines, and the like, which he richly mines. Explaining his attraction to the anachronistic charge of these mass media artifacts, he relates: 'I'm fascinated by the collapse of histories, and the confusion that results when there is something slightly wrong in a photograph'.[26]

To see Lassry's work in person, hung on the walls of a gallery or museum, is to be presented with images that invite us to play that familiar game of 'What is wrong with this picture?' Lassry's photographs are generally printed at the size of an eleven-by-fourteen-inch magazine page. Lacquered frames echo the saturated colour scheme within the photograph, turning the two-dimensional picture into a self-contained, three-dimensional object. When it was first shown at the Whitney Museum of American Art in 2009, Lassry's film *Untitled*, with which I began this chapter, departed somewhat from this exhibition format. It was screened in the 'black box' of a darkened room, with viewers free to walk about the whirring 16mm projector or to get

25   Lassry, 'On Display', p. 93.
26   Lassry, cited in Christopher Bollen, 'L.A. Artworld: Elad Lassry', p. 42.

12. Elad Lassry (b. 1977), still from *Untitled*, 2008. 16mm film, colour, silent, 9:20 min. © Elad Lassry, courtesy of 303 Gallery, New York.

as close as possible to the projected image. This physical mobility was not in itself what made the experience exceptional; it was the human figures inside of the picture, who, fidgeting and shifting, overtly solicited us, as if we were indeed occupying the same room. In the photographs from which Lassry drew the *mise-en-scène* for the film, the actors alternated between the 'right' and 'wrong' positions to educate students about the placement of the camera to produce a picture in accurate perspective. Subverting this premise, Lassry lingers on the flickering disjunction between these two positions—one where the illusion of three-dimensional space clicks in and the other where the actors are stranded in a two-dimensional 'flatland'—to provoke a 'nervous' reaction from viewers. We sympathetically recalibrate various parts of our bodies to make the illusion 'work', mirroring the bodies in the film that cannot seem to keep still.

    In one episode, the woman in a pink dress poses her arm over the house's window. Her body droops and drapes, hovering just a bit above or below the mark. She looks up at the camera, which seems to be perched somewhere above her, with her feet planted on a noticeable downslope. In the film's most comically jarring shot, three of the actors, each of proportionally equal size, lounge on the roof, while the fourth, now twice as big as her companions, fills the height of the house's doorway. We know from the lesson of the Ames

room that the space in front of the camera must be distorted, and that the camera itself—along with our point view—is probably floating on some other plane. Where 'up' equals farther back and 'down' farther forward, we might guess, among any number of configurations, that the foreground of the picture is tilted downwards, the background tilted upwards, and the entire ground, perhaps, tipped sideways. The weird anti-gravity of the painted backdrop cancels out all depth of field, conflating the near and the far. We quickly realize, in our scaling 'upwards' and 'downwards' for constancy, that the space the actors see cannot possibly correlate to the one we see. As the perspectival illusion of the house fades into the two-dimensional prop that it is, we get the weightless feeling, as Fredric Jameson has written in a different context, of a 'space existing in two distinct dimensions at once, in one of which it leads a rectangular existence, while in that other simultaneous and unrelated world it is a parallelogram'.[27]

Staging a still photograph as a moving image, Lassry teaches us how to look at the photograph as a covertly kinetic space, even if it emphatically does not move. Like Moholy-Nagy and Ames, he interposes the human body as a site of instability to convey the aberrant topologies that can propagate within photographic space. Tracing out the 'relations between the position of bodies' from shot to shot, we start to discern that the space inside of the photograph can collapse manifold, sometimes incompatible planes of orientation into one. Lassry has said that, as a formal tactic, he likes to toy with the camera's propensity to distort space and flatten dimensionality. Where an ordinary photograph might have one plane in focus—the foreground, the background, or a subject centred in the middle ground—he prefers to have several subjects in focus, without a centre, leaving viewers to sort out these spatial contradictions on our own.[28] Like the four figures in *Untitled*, bodies and objects in Lassry's pictures are regularly suspended in this liminal space of unresolved dimensions. In this regard, putting his work into dialogue with Jameson is apposite. The stylized nostalgia of Lassry's aesthetic undoubtedly resonates with the tenets of postmodern pastiche. But it is Jameson's description of a 'new kind of flatness or depthlessness, a new kind of superficiality in the most literal sense' that distinguishes what he names postmodern 'hyperspace' upon which I would like to dwell.[29]

Writing in the early 1980s, Jameson diagnoses this by now retro-sounding formulation of postmodern hyperspace as a symptom of the burgeoning

27   Jameson, *Postmodernism, or the Cultural Logic of Late Capitalism*, p. 126.
28   Lassry, 'Photography and Composition'.
29   Jameson, *Postmodernism, or the Cultural Logic of Late Capitalism*, p. 9.

digital or information age. Usurping the 'depth model' of an older, modernist space, this new space thrives on the 'hallucinatory exhilaration' of multiplying surfaces. In a memorable section of his essay 'Postmodernism, Or, The Cultural Logic of Late Capitalism', Jameson guides readers through the interior of the Westin Bonaventure Hotel in downtown Los Angeles, using it as an allegory for the physical experience of this hyperspace. The Bonaventure is portrayed as something like an impossible space: its mirrored, cylindrical outer shell, unmarked entryways, and meaninglessly colour-coded elevator towers (green, blue, red, yellow) spit visitors out into the 'placeless dissociation' and 'milling confusion' of indoor garden lobbies and pod-like gym balconies. Jameson extrapolates from this exasperating architectural folly to proclaim the utter bafflement of our bodies: 'This latest mutation in space has finally succeeded in transcending the capacities of the individual human body to locate itself, to organize its immediate surroundings perceptually, and cognitively to map its position in a mappable external world.'[30] The 'compass' of linear perspective, with its orderly plotting of up and down, left and right, front and back, proves to be a thoroughly inadequate means of orientation within this supremely warped hyperspace.

For Jameson, the convolutions of postmodern hyperspace reflect the sprawling global network of late capitalism. Yet, like Moholy-Nagy, he isolates the human body as a visual and cognitive training ground. He issues his own injunction 'to grow new organs, to expand our sensorium and our body to some new, yet unimaginable, perhaps ultimately impossible, dimensions'.[31] Across a modernist and postmodern conceptualization of space, it is thus our bodies that are relentlessly impelled to speed up and rescale to spaces that are ever more pliable and beyond our grasp. Intervening in this race to upgrade the body, however, I put forth the speculative claim that the 'depthlessness' and 'superficiality' of Jameson's hyperspace, understood in the terms of the current cultural moment, are nothing but shorthand for the profoundly synthetic space of the digital screen. I use 'synthetic' in the dual sense of something manufactured as well as a bringing together, a synthesizing, of heterogeneous spaces. In the alternative genealogy of photographic space that I have delineated, the ambiguous topologies of the photograph prefigure the dislocations of postmodern hyperspace, which culminate in the infinite plasticity of the digital screen as an informationally driven and spatially changeable interface. While the computer screen defaults as a perspectival display, it can just as effortlessly morph into a topological

30   Ibid., pp. 42-44.
31   Ibid., pp. 38-39.

space, with no predetermined centre. At its core, the computational space of the screen breeds what I would label as a rampant digital illusionism. Where the illusion of perspective in a photograph is inevitably tied to one position in space—and one ground upon which to position the body of the viewer—the screen can algorithmically remove and replace this ground, multiplying the illusory effects of perspective freed from the camera's rigid point of view.

The ascendance of this digital illusionism itself runs parallel to a genealogy of the computer as an information-processing system that subsumes, but exponentially surpasses, the optical logistics of linear perspective. In *Software Takes Command*, Lev Manovich aptly classifies the computer as a 'simulation-augmentation machine'.[32] As he points out, Photoshop applications like the paintbrush, eraser, clone stamp, drop shadow, or 'dodge', 'burn', and 'blur' filters replicate the effects of physical tools and phenomena in the virtual 'darkroom' or 'canvas' of the digital screen. Manovich cautions, though, that 'what begins as a reference to a physical world outside of the computer if we use default settings can turn into something totally alien with a change in the value of a single parameter'.[33] Spanning the spectrum from simulation to augmentation, every photograph 'developed' through Photoshop can accumulate multiple 'layers' with infinitesimally adjustable degrees of transparency and opacity. Beyond the cut-and-paste of old-fashioned collage, the programme compresses these layers into a seamless composite. Within this multi-layered depthlessness, the 'prop' of perspective may be prominently displayed, occluded, or pushed to the side. The illusionism of the digital screen builds momentum from this accretion of perspectival positions and relations. The digitized image may initially look like a photograph—offering one view of the world from a pre-given position—but it can steadily mutate into something else. Again, the photograph does not move, but everything within it can be moved, placed side by side, or on top of each other. Two dimensions not only become three but four, or ten, or a hundred—a polyground of elements stacked in a paratactic, rather than a hierarchical, order.

And yet, as we saw with the Ames room, non-digital images and spaces can have palpably digital effects. They can look just as flattened, layered, deformed, and so on, confounding our sense of scale and direction, while deriving from a purely analog source. Lassry cannily situates his 'nervous pictures' on this digital-analog mimicry divide. Making analog photographs

32   Manovich, *Software Takes Command*, p. 135.
33   Ibid., p. 136.

that look analog but that are discreetly modified by digital tools imitating analog tools, he instills the photograph with an elusive digital 'noise'. 'I [do] not feel it [is] necessary', he qualifies, 'for my photographs to look like what we think of as a digital photograph'.[34] But most of his photographs are nevertheless digitally enhanced or tweaked, folding algorithmic patterns into their analog grain. Two of his photographic portraits, *Man 071* (2007) and *Felicia* (2008), trigger the dissonant effect of this digital illusionism. To make them, Lassry took multiple exposures with a large-format, four-by-five camera, which he then scanned and combined in Photoshop. *Man 071* reworks the industry staple of a smiling actor's headshot into a perceptual problem. A smiling, shirtless man is photographed against a shallow blue backdrop with an accompanying blue frame. His face, neck, and shoulders are brightly lit, in focus, and still—all except for his eyes, which appear to pop out at us. The man stares off into the distance, but the vaguely 3D blur, even dizziness, we come up against in trying to 'catch' his gaze unravels into a kind of 'autoscopy': we feel our own eyes trying to focus, to attain a sense of perspective.

Coming face to face with Lassry's photographs precipitates this fidgeting bodily nervousness. We hesitate: is the photograph moving or are we? In *Felicia*, Lassry amplifies this mesmerizing visual stutter. A young woman poses against a florescent frenzy of confetti dots. She smiles shyly at the camera with a sidelong glance, such that, as we move, her eyes seem to follow us. *Felicia*, more than *Man 071*, appears to tremor. Recalling the vibrating shimmer of a lenticular print, it reverberates with a subliminal visual tinnitus, or a magnified motion parallax. The outer field of our peripheral vision overtakes the dominant focus of our central vision as the invasive blur that permeates the picture distracts us from fixing on any one point of view. Akira Lippit has eloquently written that in Lassry's photographs, 'nothing appears to move, yet the feeling of movement persists everywhere within the image'. In the 'motionless stir of the image', one sees 'the act of another looking, the movement of another's look'.[35] The micro-actions of our seeing are doubled and projected back at us. The photograph jitters along with the rapid saccadic movements of our eyes—looking up, looking down, blinking to keep up with its fluttering displacements.

Lassry's digitally augmented photographs continue the project of Moholy-Nagy's New Vision as a proprioceptive animation of our vision. A 'vision in motion' is made manifest through the involuntary somatic movements of

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34   Lassry, Elad, 'Lassry in Conversation with Jörg Heiser', p. 7.
35   Lippit, 'One, or Several (Blue) Wolves?', p. 131.

our eyes and bodies striving to get a better grip on the image. We reposition ourselves, again and again—stepping back, to the side, then forward, tilting our heads and necks from one angle to another, or tentatively reach out to 'touch' the illusion. The kinesthetic demands of these pictures complicate Gregory's 'upwards' and 'downwards' model for solving optical illusions. We pause and stall, unsure of how to decipher their indefinite blur, well aware that any photograph we see today could be analog or digital, Photoshopped or not. What is at stake in recognizing this difference? I assert, along with Lassry, that while the actual difference is incidental, our growing consciousness of the multiplicity of the digital is tripping up our facility to settle on a 'top-down' interpretation that can conclusively 'place' the image. With nearly all photographic images passing through the computer—whether they are taken, viewed, or disseminated through its virtually networked screen—the digital insinuates itself as an immanent interference pattern. Like the fallible observer of 19th-century philosophical toys, our vision is permanently dilated through this extended realm of illusion. The ubiquity of digital activity in our everyday lives is aggressively querying how our eyes and minds organize—or, put differently, how we cognitively map—our place in the world as it is mediated by the endlessly permutational space of the screen.

Invoking this idea of a 'cognitive map' brings us back to Jameson. For Jameson, an aesthetic of cognitive mapping resists the disorienting effects of a spreading global capitalism. It serves as a spatial analogue to Louis Althusser's theory of ideology as 'the imaginary relationship of individuals to their real conditions of existence'.[36] My usage of the term reverts to its more mundane definition as the mental picture we form to represent and locate ourselves in space—a definition to which Lassry subscribes. 'I'm interested in the viewer making mental pictures', the artist states, or 'how an image can travel, starting with something that you look at then becoming this echo of a mental picture that keeps moving around in your head'.[37] As we have seen, the 'symbolic form' of perspective is one such

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36 See Jameson, 'Cognitive Mapping', pp. 347-357. Jameson threads his thoughts on cognitive mapping throughout his writings on postmodernism, applying a figure of spatial analysis to the social structure of a given historical moment. He associates, for example, the first stage of capitalism with the 'logic of the grid' and the 'geometrical and Cartesian homogeneity' of perspectival space (p. 349); the second stage with the imperialism of an industrial modernism enmeshed with 'the new global relativity of the colonial network'; and the third, late stage with the breakdown of the grid in postmodern hyperspace and the insertion of the subject into a 'multidimensional set of radically discontinuous realities' (p. 351). As a consciousness-raising aesthetic, cognitive mapping invents new literary and artistic forms to intervene in the collective incapacity for representation wrought by the postmodern spatialization of capital.

37 Lassry, 'Interview with Brendan Fowler', p. 61.

mental picture for bodily orientation. It, too, is a historically contingent ideology—an 'imaginary relationship'—that produces a 'sense of space' that has over-determined our 'sense of the world'.[38] While this criticism of perspective is by no means new, it is my contention that the merging of photographic space with the computational space of the digital screen is excavating the latent ground of other spaces that have resided unseen within the photograph's picturing of the world. Lassry's work involves the viewer in investigating this nascent ground. His 'nervous pictures' are rooted in our seeing bodies reacting to the ambiguous spatial possibilities within the photograph. They chart out mobile paths for our looking, viscerally displacing us from position to position, view to view. Untethered as subjects of perspective, we can attune ourselves to the surprising spaces that open up within the photograph. Its buried topological contours surface as we come to perceive the position of our bodies in perpetual relation to some other position in which we might be.

In this bind between vision and proprioception, to 'see the world with entirely different eyes' is to make these moving 'mental pictures' of the progressively blurring boundary between virtual and physical space as they meet in the photograph's branching topologies. One difference between the analog and the digital that debatably does matter in this perceptual mapping process is that, when seen on the computer, Lassry's pictures are flattened in multiple ways on the unifying plane of the digital screen. They are image files compressed, stored, and randomly resized like so many pixelated scraps. But this segues into another set of issues about quantity, scale, and information that a generation of 'Post-Internet' photographers—of whom Lassry is but a precursor—are dealing with in diverse ways.[39] It is certain, though, that unexpected paths are unfolding through which our eyes and minds can move. The next question to ask, then, positioned as we are on this evolving ground of contemporary photographic space, is: How are we oriented in the world now? And towards what?

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38   Panofsky, *Perspective as Symbolic Form*, p. 34.

39   Although the term 'Post-Internet' periodizes a range of practices across media and genres, artists who notably work within the expanded image culture of the internet include Michele Abeles, Katja Novitskova, Artie Vierkant, and many of the artists in the show 'Ocean of Images: New Photography 2015' at the Museum of Modern Art in New York, NY. Forging an 'Internet-aware' aesthetic, these artists combine sculpture, analog photography, born-digital images, and the fluid 'online' and 'offline' presentation and distribution of their work at galleries, through books and PDFs, and on the Internet. See Vierkant, 'The Image Object Post-Internet', <http://jstchillin. org/artie/vierkant.html> and Katja Novitskova, 'Post Internet Survival Guide'. <http://katjanovi. net/postinternetsurvivalguide.html>. (Both accessed 5 August 2016).

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7.   Surface Explorations: 3D Moving Images as Cartographies of Time

Nanna Verhoeff

Abstract

In this essay, I examine how the trope of navigation in 3D moving images can work towards an intimate and haptic encounter with other times and other places. The particular navigational construction of space in time in 3D moving images can be considered a cartography of time. This is a haptic cartography of exploration of the surfaces on which this encounter takes place. Taking Werner Herzog's *Cave of Forgotten Dreams* (2010) as a theoretical object, the main question addressed is how the creative exploration of new visualization technologies—from rock painting and principles of animation to 3D moving images—entails an epistemological inquiry into, and statements about, the power of images, technologies of vision, and the media cartographies they make.

Keywords: Surface, cartography; navigation; 3D, animation; haptic visuality

Explorations

Werner Herzog's *Cave of Forgotten Dreams* (2010), a 3D documentary about the prehistoric cave paintings in Chauvet in the south of France, raises questions about the relationship between image, technology, and epistemology. The film shows striking and vibrant Paleolithic drawings, mostly of animals, from more than 30,000 years ago. The depiction of galloping herds of animals is characterized by a high sense of motion, and the bulges and contours of the rocky surface create a striking effect of three-dimensionality to the images. By navigating through the space, the film camera charts the spatial structure of the cave with its labyrinth of corridors, walls, niches,

and chambers. Moreover, while watching the descent and following the explorers very closely, one can almost feel the humid chill they experience in the depth of the rock formation. Characteristic of the film's visual style are the long *tracking shots* moving along the rock's walls, usually sideways, produced by the explorer-camera person. The voiceover informs us of the difficulty in getting access and how this is the first and perhaps only time that a camera is allowed in the cave. Well-aware of the uniqueness of this moment, the viewer gets the sense that the explorative gaze of the film crew who enters the cave for the first time parallels her gaze as a spectator. This second-hand or visual exploration of space—so characteristic of travelogues and other types of moving-image navigation—brings a sense of simultaneity, of liveness to the filmic experience.

While the connection to colonial and imperialist, and gendered, tropes of spatial exploration is clear, the film also speaks to a self-reflexivity in visual media forms that explore and investigate the specificities of their (new) technologies and processes of visualization. In this case of cinematic archeological exploration, the movie suggests how moving images of spatial navigation can construct what we may call a haptic cartography of time. Whereas one may argue that all films map narratives spatiotemporally because they are time-based representations of space, in this case of 3D navigational imagery, something more is at stake. The mobile camera's navigation of the cave, its documentation of the surfaces, and its mode of exploration put us back in touch with another (image) time, extending the historical layering of the filmic image and, as I will argue below, augmenting the cartographic in this experience of navigation as a cartography in-the-making. Departing from the notion that moving as well as still images give expression not only to their contents or subject matter but, more importantly, to the relationships between the seer and the seen, I would propose that the film itself, its mode of filming and editing, offers a distinct form of knowledge production countering other, perhaps more traditional visual methods that are anchored in distanced objectification of the objects studied.

The film experiments with and reflects on another aspect of exploration: not of discovery, dissection, and containment but of alternative ways of seeing itself. As such, it explores exploration. Here, 'seeing itself' is staged as an encounter—an encounter at the surface. As Giuliana Bruno examines in her recent impressive study, the many surfaces that surround us function as connecting tissue, as meeting places that connect bodies, subjects, materials.[1] Following her approach to surfaces as sites for material

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1   Bruno, *Surface.*

relations, mediation can be conceived of as the process that takes place on the surface—irrespective of the fundamental phenomenological characteristics of material and sensory qualities that surfaces may have. This primary and inherently sensuous encounter can be re-mediated at another surface on which this new encounter takes place. This is a layering of sorts. And these surfaces connect via technologies of representation. Therefore, I am interested in the way this film as a study of exploration and visualization provides an opportunity to think differently about the epistemological and theoretical stakes of mediated vision. In the case of the time travel that the films portray, it endeavors to produce a counter-cartography *of* time *in* time, in which the co-presence of two worlds—of viewer and image—is traced on the contours of the surface.

Moving Images

Explorations concern the potential power of images to move us. Being 'moved' is an alternative to distancing mastery; going along is a very different attitude from taking possession, from capture. 3D technology can help us to develop and practice, and also understand and be aware of this attitude in looking. Space in 3D is not represented on a structured plane with a fixed vanishing point but allows a closer engagement with the movements through space as well as time. But technology does not operate in cultural isolation. Indeed, Jihoon Kim has suggested that 3D moving images perhaps first and foremost invite investigation of 'archaeological, aesthetic, cultural and industrial underpinnings suggested by 3D's varying forms from the predigital through to the digital age'.[2] Expanding this cultural and historical framing of 3D imagery, my argument here departs from the assessment of 3D imagery as a technology for visualization but ultimately focuses on the reflection on the potential relational implications of spatial exploration and navigation and the visuality this produces. My questions are fundamentally about the haptic and spatiotemporal underpinnings of (visual) navigation that Herzog's 3D documentary addresses and through which the meanings of the technology come into purview. In other words, I am interested in the way the film explores, and invites an exploration of, its own means for exploration.

2   Kim, 'Introduction', pp. 391-395, 392. About 3D technology and the role of Herzog's *Cave of Forgotten Dreams* in the introduction of digital 3D in European art houses, see Christie, 'Will the 3D Revolution Happen', pp. 115-135.

In particular, this 3D documentary suggests a haptic mode of visualization that is experimental in essence and (hence) self-reflexive in its use of moving-image technologies and the way we can visualize, beyond our usual limitations, what is *elsewhere* and *elsewhen*—to examine another place and time. To be accessible, this 'elseness' needs visualization, mediation, which unsettles the habitual nature of seeing and the close relationship between haptic experience and knowledge. Across time and space, it addresses a spectator explicitly situated in the 'here' and 'now'. In order to stage a more or less intimate and close encounter, the elseness—as a spatial and temporal conception of 'otherness'—demands a direct engagement of the subject with this evocative confrontation with the past in a mix of observant reflection and communicative affect. This engagement puts the body of the spectator in the centre of the event of viewing.

As an alternative to traditionally more distant (and distancing) modes of knowledge production in a haptic cartography of time, as we may call it, *Cave of Forgotten Dreams* explores the nature of exploration as such. The cave of the title is visually excavated as both an archeological site and a location-based image archive.[3] In the mode of an expedition or travelogue, the film provides access to the depths of the cave and allows the viewer-visitor to look around. But caves are never neutral spaces. In Plato's allegory of the cave, a hollow space stands for the deceptiveness of representation. In Fritz Lang's *Metropolis* (1927), it evokes the social subjection of workers. In neither case is the somewhat facile yet persistent association with female genitalia Freud brought to our attention entirely absent. It is this near-inevitable but banal genderization and allegoric reading of the cave that Herzog's film—while certainly alluding to it in the poetic and melancholic voiceover—also counters through a variety of modes. Beside the more poetic and nostalgic undertones, it invites reflection on visualization as a time-based mode of intellectual exploration. A central strategy for this reflection is the bringing to the fore of the tension inherent in the cinematic moving image between a more or less habitual desire for visual exploration and immersion on the one hand, and a resistance against these ambitions on the other.

That the production of knowledge is at stake—in this case, in the clearly traditional rhetoric of the film poster used for advertising, of the 'lost master-piece' from an ancient moment in human culture—becomes clear in Herzog's

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3   Akira Mizuta Lippit speaks about a 'cryptographic archive' in the case of the cave of Lascaux: 'For many, those images form a vast cryptographic archive, the key to a material history of language and thought as forms of graphic expression.' Lippit, 'Arche Texts', pp. 18, 20.

voiceover as well as in the interviews with the scientists who explore and analyze the cave. They all ask questions about the meaning of the images and speak of the wonderment and (in)accessibility of these meanings. Instead of a sober, scientific exploration with a clear goal of opening up and mapping by traversing and dissecting the cave, in their explanation of their analytical methods the scientists insist on an epistemological modesty. A document of archeological as well as cartographic exploration, this 3D movie provides visually powerful images that evoke a haptic and sensuous *encounter with* the space of the cave, the texture of the rock formations, and the layers, relief, and curves of the paintings. I argue that the film creates an auratic *presence*—in Walter Benjamin's sense—as well as a temporal *present*, of the deep history of the place.[4]

To begin with, the film questions the dichotomy of moving versus still images, a dichotomy that, paradoxically, *fixates* movement. Herzog's film stages an encounter between the (doubly) moving image of the tracking shot and the technically still images of the cave drawings on their silent walls that are brought to life by light and (camera) movement—a feature that Herzog himself calls 'cinematic'.[5] In the following I address the multi-layeredness of both still and moving images of spatial (cartographic) and temporal (archeological) exploration as moving in multiple directions and temporalities—past, present, and future. Hence, the film is three-dimensional not only in spatial-visual terms but also in temporality. One mode of transforming traditional exploration is the bond the film establishes between exploration and animation.[6]

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4   Benjamin, 'The Work of Art', pp. 217-252. For the relationship between cartography and architecture on the one hand and the cinematic image on the other from a feminist and 'sensuous-theoretical' perspective, see Bruno, *Atlas of Emotion*.

5   In his above-mentioned essay, Lippit has also made the argument for the cave paintings as anamorphic and animated/animating: 'The Lascaux paintings appear to utilize the surface of the cave's walls in such a manner as to suggest not only movement but a singular vantage point. The phenomenon of anamorphosis appears at work in Lascaux if not as an intended method, then as an unintended result.' See Lippit, 'Arche Texts', p. 26.

6   While too specific to elaborate here on the term 'visualization' and its background in computer science, a useful documentation of the very early definition of the term can be found in the report by McCormick et al., 'Visualization in Scientific Computing'. Also, I want to point out the cartographic background of the term as used for the representation of scientific data, evidenced by the pervasiveness of the metaphor of 'mapping' in other fields. About visualization principles in cartography, see Kraak and Ormeling, *Cartography*. For crossings of cartography and other disciplines, see Pickles, *A History of Spaces*. About the consequence of the shift from the image as object to the image as interface for museums, see De Rijcke and Beaulieu, 'Image as Interface', pp. 663-685.

Animation in Navigation

The film's potential for dialogic encounter shows itself at the intersection of *animation* and *exploration.* The former brings space into time: in duration and into the present. The latter is a particularly haptic and navigational form of spatiotemporal mobility. Animation is, indeed, the art of difference and transformation. I take this conception of animation from South African artist William Kentridge as he explains his stop-motion animation technique of constantly revised charcoal sketches. The succession of changing images gives life to images by setting them in motion. His signature method is one of *palimpsestic*—rather than *serial*—re-drawing and erasing of the same image with slight differences of which he manually shoots film frames. These drawings-for-projection are emphatically contemporary; the subject matter of his work deals very much with the (re-)writing and (re-)imaging of history.[7] Yet as traces, they evoke, formally and conceptually, the pre-historical and long-hidden cave drawings that Herzog's camera traces (follows) and tracks (records) precisely in his effort to animate them. Herzog, like Kentridge, animates the images. Or rather, he tracks or draws out the layers of animation already inherent in the paintings themselves.[8]

    As we will see below, the cave paintings themselves also show images 'with difference', in Kentridge's sense, albeit with difference within the same image, for example, when portraying running animals with one body and multiple legs, suggesting movement. These recall Étienne-Jules Marey's chronophotography—an effect that Herzog himself calls 'proto-cinema'. In his voiceover, he compares the illusion of movement of the layered images to frames of animated movies—which indicates how movement is suggested by the dissection of movement into overlaid frames. Other panels in the cave show images that are overlain with 'newer' images with probably

7   William Kentridge explains his method in a video released by SFMoMA in 2009, available on the accompanying website for the 2010 exhibition *Five Themes* at MoMA. See http://www.moma.org/interactives/exhibitions/2010/williamkentridge/. (Accessed 15 October 2015). About the archival character of Kentridge's work, the layering of techniques and times, and the mnemonic quality of what he calls *tracing*, *tracking*, and *tracting*—a distinction he makes for observing, recording, and 'drawing out'—see Hecker and Kentridge, *William Kentridge*. About his palimpsestic animations, see Krauss, 'The Rock', pp. 3-35.

8   This is an allusion to cel (or cell) animation technique—traditional animation based on a succession of individually hand-drawn frames on celluloid sheets. It raises questions about the role of 'layers' in analogue techniques 'infecting' digital cinema techniques, a topic that lies beyond the scope of this essay. For a more in-depth inquiry into cel animation techniques, see, for example, Thompson, 'Implications of the Cel Animation Technique', pp. 106-120; and Riffel, 'Dissecting Bambi', pp. 3-16.

thousands of years in between, as the voiceover explains. In this respect, the movie brings another layer to the animation of the paintings: one that is produced by visualizing (and hence, according to my argument, analyzing) *transformation* and *difference* not only in temporal but also in spatial terms—in moving as well as 3D images.

Different as they are in other respects, both Kentridge's animations of still images (drawings) and Herzog's film that animates the cave paintings are strongly invested in replacing an optic mode of looking by a haptic one. Although there is much scholarship on haptic looking, I limit myself here to those aspects relevant for my case. The term, introduced in 1901 by Alois Riegl, has been brought to bear by Gilles Deleuze on impressionist painting. Haptic, from the Greek *aptô* ('touching'), is characterized by three related primary features relevant for both Herzog's film and Kentridge's animations. The haptic solicits *proximity*, inviting viewers to caress the image with the eyes; it is ultimately *formless*, and in consequence, lines *change* their function. I take this trifold characterization of the haptic from Mieke Bal who, departing from Deleuze and Guattari, has defined the haptic as enhanced by a 'dialectic between form and formlessness' that emerges in the act of approaching the work of art that she analyzes. It is the disappearance of form into formlessness and the emergence and movement of lines that characterize the haptic encounter.[9] Indeed, the haptic encounter in the case of Herzog's film seems to bring about mobility rather than abstraction in a parallel animation of gaze, surface, and lines. The haptic look is particularly solicited by images animated by tracing (Kentridge)—created by following the flow of transition—as well as layering (Herzog)—by exploring the spatial dimension. Tracing can be understood as a haptic form of spatial exploration and as such engages the more invasive yet paradoxically fundamentally distancing forms of exploration in an oblique polemic. As per Kentridge's method, tracing is an encounter with difference and transformation resulting in movement. It emphasizes space as an emphatically experiential category. Animation as such can be considered a thickening of both space and time in movement. Fred Truniger makes a similar point in his work on what he calls the filmic mapping of dynamic landscape. Commenting on seeing landscape in 'experiential' rather than 'aesthetic' terms, he considers this distinction as oppositional to be problematic. Indeed, is the aesthetic not experiential? It is clearer with temporal specification: experiential temporality rather than aesthetic fixation.[10]

9   Bal, *Endless Andness*, p. 92.
10   Truniger, *Filmic Mapping*, p. 77.

Seen in these terms, Herzog's film suggests a layering in animation, by literally bringing movement to the surface. Or, to be more precise, working with the visual effects of succession as well as depth, making 3D besides a spatial also a temporal quality, the film proposes the relationality of the visual, in both temporal and spatial terms. A concept of central importance here is the *index*. Elsewhere, I have argued for an extension of the semiotic sign of the index (following Peirce). This is usually taken as either pointing to the past (the trace) or the present (deixis). I have pointed out how, in tools for navigation on the mobile screen, the index used as *tag* or digital spatial marker encapsulates a *future*-oriented destination.[11] This destination-index should be understood as a shifting referent rather than a fixed endpoint. This understanding of the index implies that an image can no longer be seen only as a result, a fixed and visual representation, but rather as a temporally layered object for a dialogic and haptic, multi-directional engagement with space and time. The image is now a tool for more (subjective) engagement instead of contemplation of a distant object.

Paradoxically, then, with its emphatically nostalgic and 'poetic' overtones, this film about ancient images is perhaps somewhat future-oriented as well, in its conception of imaging as process. In this sense, it demonstrates navigation as a cartography in-the-making. This semiotic and performative starting point helps us to reconsider the dimensionality of the image—be it still or moving.

Key characteristics of navigation are performativity and process. Inspired by Herzog's film, my point in this essay is thus an understanding of the layeredness of images in time as well as space. Images are thus not fixed within an opposition of still versus moving—as is perhaps never really the case in filmic projection. Instead, this layeredness emerges in a haptic engagement with the image. As a consequence, the image never stands still. This is, for me, the extended but crucial sense of the idea of animation. By both tracing the walls with images as well as showing their spatial layering and the resulting optical effects of moving lines and light, the movie evokes a sense of presence—not only in (unfamiliar) space but also and very powerfully at the very moment, and in the duration, of happening. This illusion of contemporaneity is a key feature of the time-based experience of the cinematic moving image. It is premised on deferral or temporal disjunction.

This experience of presence and absence, simultaneity and asyncronicity, is indeed quintessentially cinematic. This is perhaps why the visual form of navigation is such a powerful cinematic trope. Here, the movement through

11   Verhoeff, *Mobile Screens*.

the space of the cave is doubled-up, combined with making images move *in* animation. This occurs through tracing the painted lines on the walls but also zooming in and following the contours of the rocky surface in its flowing movement to and from the camera. Also, the flickering lights held close to the images bring about another layer of movement in a play of light and shadows. The movements as such are not only lateral, at a regulated and fixed distance, but also explore the irregularity of surface in the form of a haptic caress, following its three-dimensional dynamic face. Hence, this form of animation is emphatically 3D, perhaps even 4D: in spatial terms by visualizing spatial complexity at the surface, and in temporal terms as taking place in the encounter.

In his conceptualization of a haptic notion of perception that brings together movement and action with visual perception, architect and theorist Lars Spuybroek reflects on the cave as a concept. He refers to the work by Jean Clottes and David Lewis-Williams, who have studied rock paintings in French and Spanish caves. Spuybroek is particularly interested in their observations that the images of animals seem half-finished in paint, and yet with light effects of torches shining on the caves' surfaces they become 'finished', even animated. As Spuybroek poetically concludes, 'the body looking at it "flies" in'.[12] To me, this underscores how the optical effect of the three-dimensional relief—what he calls the topography of the rocks—infuses the images at the surface with motion in the act of looking. This effect of finishing and, indeed, animating the image Spuybroek compares to the principle of interactivity of, for example, electronic art—a comparison that indeed foregrounds the 'liveness' of the image as event in the encounter.

When we look back at the film, we can clearly see how the slow tracing of the painted rock surfaces by the camera is a signature of the film's visual style deployed to show the images not in isolation but within their material and only partly accessible spatial context. The explorers/cameras have to tread very carefully on the narrow pathways that provide (and restrict) passage through the space. The slow 'stroking' and following of the contours of the image surfaces by the subjective camera, which the eyes of both the explorer and the film viewer do, provides both a sense of proximity and intimacy as well as of careful distance. Access and distance coincide in these images that create a relationality between image-object (the cave surfaces) and the image-subject (the eye of the beholder). Thus, they make clear that seeing is not physical touching and that tracing is not framing. They engage

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12   Spuybroek, 'The Soft Machine of Vision', pp. 94-111. See also Clottes and Lewis-Williams, *The Shamans of Prehistory.*

difference and refuse visual fixation, spatial dichotomies, and territorial domination. Instead, this engagement is more intimate or dialogic, with the image and its user-viewer as the two interlocutors in an I-you exchange. The desire for haptic encounters and dialogic engagement brings forward a different visual paradigm that deviates from a visual discourse based on distance, difference, and objectification.

The visual technologies involved here are a confrontation—or exchange—between contemporary 3D cinema and ancient 2D (but perhaps also already 3D) rock painting. These millennia-old drawings are mute and still but come to life—are animated—in the encounter. In accordance with Peirce's dynamic conception of semiotics, in the relationship the subject, the knowledge producer, becomes vulnerable and changing. The flickering lights and subsequent movement intimate such vulnerability. This entails in some cases an archeological as well as a cartographic logic, dealing with issues of access, deixis, and the haptic aspect of being 'in touch', as I will explain below. The objective seems to be the experience of the exploration and excavation.[13]

Three main and intertwined aspects of the image are central so far: access, deixis and the surface. These three aspects work towards an engagement of the subject with the image at the surface. It is, precisely, the tension at the surface—the tension between closeness and distance—that shapes the process of this form of animation. This process is dialogic because it animates the image through the viewer's presence and response, intellectually, sensorially, and even physically, to the images in process.

Cartography of Time

In contrast to the more usual conception of the 3D image as offering a means for heightened spectatorial immersion in the moment, the exploration offered in Herzog's film operates more as an encouragement for spectators to actively engage with a visual imagery of *elsewhere* and *elsewhen*. Herzog shows an alternative mode of engagement, also in space, to the passivity allegedly suggested in the metaphor of immersion. His active immersion suggests a form of participating through 'accessing' as a dialogic and experiential form of interpretation by exploration, more on the terms of the object itself rather than a sinking into a different realm or (fictional)

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13   About the role of the subject in Peircian semiotics and the question of experience, see De Laurentis, 'Alice Doesn't'.

world. Hence my preference for the term engagement, of which active immersion would be a variant. A focus on dialogic encounters allows us to sidestep questions of scopic mastery and submission to 'visual pleasures'.[14] Moreover, such a revision of immersion into active engagement allows us to investigate how technologies of vision are used for and experienced as creative experimentation and engagement, rather than for an affirmation of the logic of dualism, classification, and separation.[15]

In the mode of an archeological exploration, Herzog's documentary *Cave of Forgotten Dreams* is a quintessential travel film, both in a spatial and a temporal sense. The camera operators shoot the film as they descend into the cave, taking the viewer along as they encounter this unfamiliar territory. It provides visual-spatial access to the Chauvet cave—access both in terms of 'admittance to' and 'contact with'—which was discovered in 1994 and, as mentioned above, is inaccessible to the public for preservationist reasons. This detail is relevant, for it gives all viewers a privilege not otherwise available—a trope in virtual travel imagery with a long history. The coincidence of filming and access suggest equality between filmmaker and viewer—albeit a promise falsified by mediation. The lack of explanatory voiceover and the silence that accompanies many of the images also contribute to an auratic sense of respectful distance and shared wonderment between explorer/camera and viewer. Framed as an archeological descent into (geological) *deep time* and (human) *deep history*, central to the film—in both its image style and in the (sparse) narrative voiceover explaining this—is the issue of accessibility and epistemological restriction.[16]

This issue is inherent in the delicacy of the spatial integrity of the cave as both place and temporal object and the precariousness of the knowledge we can have of it, but also in the process of mediation. The awareness of precarity that comes with the privilege already intimates an ethical issue.

14   I allude here to Laura Mulvey's seminal critique of masculinist modes of looking, although Mulvey of course wrote about classical Hollywood cinema and not about 3D documentaries. Mulvey, 'Visual Pleasure and Narrative Cinema', pp. 6-18.

15   Theoretical physicist and feminist theorist Karen Barad critiques the separation between 'words' and 'things' in representationalism inherent in modern scientific thought—a separation that fundamentally complicates knowledge. See Barad, *Meeting the Universe Halfway*. For an interview with Barad and more about New Materialism as a critique of these principles, see Dolphijn and Van der Tuin, *New Materialism*.

16   Deep time is a concept used for geologic time, and deep history is a term that looks at the history of human kind from a longer perspective and based on a marking of difference between 'history' and 'prehistory'. Mira Schor, quoted below, uses 'deep past' when she discusses the Herzog film. All these terms have in common a spatial metaphor for time and deictically suggest a distance of the past from an 'I' in the present.

Literally, the makers of the film are restricted by the conditions of their access and, spatially, by narrow pathways through the cave. Moreover, they get limited time for their own access. The film is self-reflexive in this respect as well. In the exposé, the voiceover explains this limitation upon entering the cave, emphasizing its exclusivity and limitation in explicitly auratic terms. Through the medium of 3D technology, the film democratizes the privilege by sharing the experience of an encounter with times so remote (and 'forgotten' as the title suggests) that they are suggested to be from an early stage of humanity. Thus, the film searches for—and along the way suggests insight into—what binds us all together across time and space. This universalizing and perhaps somewhat dramatic and nostalgic ambition notwithstanding, the ambition of *sharing* experience is different from a long history of patriarchal and exoticizing imagery of the alterity of elseness.[17]

This sharing of the there-then in a discourse addressed to viewers in the here-now is where the idea of layering comes in. While the title, *The Cave of Forgotten Dreams*, reflects nostalgically on the distance of the elsewhere and elsewhen, we encounter a sense of temporal layering of place, or placetime, by 'considering the deep past's uncanny co-existence with our present' as feminist artist and critic Mira Schor points out.[18] As such, the movie provides a time-travel experience in the true sense: it establishes a relationship with the past through reflection on the question of accessibility of this past in the present, stimulating its viewers to participate in the reflection. It explores not only the space of the cave but also its time in a movie-image excavation that emphasizes the process of opening up the site and animating the painted images of the past in a fragile presence in the present. Herzog's film reflects on, and experiments with, the visualization of a layering of space that re-animates the 'still' images that are endowed with movement and animation, and with the curves of the walls and the effect of light on these curves. The tracking shots that follow the lines of the images—not just horizontally but also by tilting and zooming and with the 3D effect—explore the texture of the image in depth, visualizing the 'depth-movement' as already intrinsic in the ancient images. The images already have movement in them, but the multi-dimensionality in the *encounter* is needed for that movement to become visible, for its performativity. The film needs the tools offered by 3D moving-image technology to deal with these layers in

17   Another project that combines archeology and innovative, immersive visualization technologies in the case of cave exploration is Sarah Kenderine's project in the Mogao Grottoes, Gansu Province, China. See '"Kenderine": Pure Land', pp. 199-218.
18   Schor, 'Wonder and Estrangement'.

13. Highly intimate shot of the camera that follows the explorers on the narrow pathways, bringing the camera close, yet at a careful distance, to the contours and curves of the painted rock surface.

a fashion that, indeed, may warrant the tweaking of McLuhan's canonical phrase into 'The Medium is the Method'.[19]

One evocative aspect of (moving) 3D images is a heightened visual effect of spatial continuity with the image-space for the spectator, a continuity that produces a direct sensual impression of tangibility and immediacy. It is often pointed out that the vertical depth of the image accentuates an immersive effect, exemplified in high-speed chase scenes or shots where the spectator seems to be plunged into the depths of space. Herzog's film proposes instead a haptic approach to three-dimensional images by explorative spatial tracking and a (horizontal) tracing of surfaces. It is in the middle ground—somewhere between self-effacing thrusts *into* space, into passive immersion, and the establishment of a self-affirming and dominant fixed point of view—that this technique also allows for more intimate, temporary haptic encounters. 3D imagery knows many forms and usages indeed.

In my work on early cinema, I have pointed out how the aesthetic of the sublime in landscape depiction sets up a dual ambition of submission to awe and wonder and a resulting desire for visual mastery.[20] This ambivalence results in tensions so effectively organized in, for example, high-paced 3D action movies, very similar in effect to the so-called phantom rides of

19   Verhoeff, 'The Medium is the Method', pp. 17-30. Janet Murray has used this phrase as well in her examination of the analysis of interaction design. See Murray, *Inventing the Medium*, p. 16.
20   Verhoeff, *The West in Early Cinema*.

14. A stereograph from the 1910s depicting the figure of a woman providing us with both an image-object and a point of identification and vicarious perspective from which to look at the vast landscape. From the author's personal collection.

early cinema. These are point-of-view shots of passing landscape taken from a moving vehicle such as a train or car. As such, they boast about the technological possibilities of travel and the moving image together. What the use of 3D technology as exploratory rather than immersive counters is this rather long tradition of visual challenge and its overcoming through domination—called the sublime.[21]

For example, before and contemporary to early cinema, the immensely popular 3D stereographs depicted locations that were meaningful for their capacity to offer a point of view, the spectacle that results, and the affective response they elicit.

Since they offer 'points' of view, or punctures of the image that make the border between represented world and viewer permeable, I have called these panoramic images—whether in 3D still images (stereographs) or in 2D moving images (cinema)—'punctuated places'. In the stereographs, the camera points at the landscape as seen from a specific spot that is emblematic for its panoramic vantage point. The image thus recreates the point of view of the tourist that looks at a well-known vista or point from this position. The spectator as stand-in embodies this gaze from the vantage point that deserves its own name. In deictic terms: the image provides a 'starting point' of a look elsewhere.[22]

21   For the sublime in aesthetic theory, see Hipple, *The Beautiful*. About phantom rides in early cinema and their analogs in contemporary visual culture, see Verhoeff, 'Pointing Forward', pp. 568-586.
22   Verhoeff, *The West in Early Cinema*, pp. 264-266.

But Herzog's film is not geared to enabling vicarious tourism. A complex temporality of the *moving* image is at work when directionality and temporality become layered. Since it is a trace of movements past, the moving image, through an emphatic present-ness of deictic positioning of visual directionality—the look-here-now of the index finger—establishes both object and subject of the gaze. The duration of the moving image that, in this case figuratively, takes the spectator along on a visual journey makes spectatorial deictic presence one that entails a future. It is in this spatiotemporal negotiation that the moving image constructs subjectivity in haptic experience.

Through this foregrounding of temporal and spatial layering, the film aligns itself with such a construction of the image-subject in contact with the object through haptic looking. In this respect, it resonates with well-established approaches in film theory that have criticized and questioned the inherent power of visuality, albeit in very different ways. The foregrounding of deixis—for example by the subjective shots and the whole issue of accessibility of the space—opens up a dialogue not only between viewer and object—the cave paintings, the walls and surfaces, and the voices—but also with a variety of approaches to film analysis. To stay with my interest in deixis, as the positioning of the subject this can be included in different approaches to the power of images. For example, if we follow a traditional psychoanalytical approach, we can argue how a deictic address of the image both gives and takes: providing voyeuristic pleasures yet enslaving the viewer in passive acceptance of the limitations of the pre-structured gaze. If we adopt a phenomenological perspective, however, we can see deixis as opening up a dialogic and haptic engagement with the moving image. This implies an entirely different relationship between subject and object and shifts the question of power from visual domination to visual engagement; from a third-person storytelling about an object to a first-person/second-person exchange of positions. Deixis is the key instrument to effectuate such a situation of exchange. And layering makes it emphatically haptic.[23]

This performativity can be understood as the construction of presence. This may resolve what Mary Ann Doane suggests is a spatiotemporal disorientation in confrontation with the moving image in projection when she writes that 'the perception of the moving image takes place somewhere between the projector and screen, and the temporary, ephemeral nature of

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23   In feminist philosophy, this difference has been put forward by Code, *What Can She Know* and Code, *Rhetorical Spaces*.

that image is reaffirmed by its continual movement and change'.[24] Pepita
Hesselberth sees this as fundamental to a 'tangibility-effect' of cinematic
deixis:

> As a projectable property then, presence—understood as the perception
> of self-existence, of 'me'—arises from the embodied interactions afforded
> within a given environment, in real-time and real-space. [...] In fact, I
> would argue that a focus on presence intimates a conception of materiality
> that is much more in sync with the cinematic project as a whole, as it
> picks up where the fear of the dematerialization of the image associated
> with luminous projection has left us: at the loss of the image's indexical
> grounding in a material object—be it celluloid or, as in the case of the
> optical toy, in the 'afterimage'.[25]

The deictic approach to the image and a reconsideration of its material-
ity opens up an understanding of a thickening of time and space in the
encounter with the moving image.

Critical thinking about performativity and the image brings out the
intricate relationship between meaning and practice, knowledge systems
and cultural forms. The connection between the very different cultural
realms (such as entertainment, art, and science) and technologies of vision,
such as the ones I invoke in this essay—photographic stereographs, 3D
documentary cinema, and effectively also cave paintings and stop-motion
animation—demonstrate how pervasive this relationship is. The performa-
tivity of these media can be seen as a different mode of exploration, one that
is not steered by the desire for domination but rather for encounter; access
earned through deictic engagement. And that is precisely how Herzog's
film establishes contact with a long-gone past on the surface of the image.
This is, literally, a cartography of time—a moving one.

Tensions at the Surface

As a 3D travelogue, Herzog's film addresses the intricate relationship
between cultural tropes—of which the association with gender of certain
epistemic and psychic attitudes is a major one—and epistemological ambi-
tions in the use of media technologies, that is, the tendency to use 3D for

24   Doane, 'The Location of the Image', pp. 151-165.
25   Hesselberth, *Cinematic Chronotopes*, p. 96.

15. Detail of layered images of running animals, visualizing movement by overlaying images in 'difference'.

visual boasting. Moreover, it is an example of those media practices that address questions about space and mobility.

The moving images shot while entering and exploring the cave provide a haptic-visual encounter with the materiality of the place. They visualize how the paintings in the cave themselves are a three-dimensional play with the texture and relief of the rocky surface. The textural materiality of the cave, in fact, seems to animate the drawings on them. As mentioned above, these layered images of different stages of (arrested) movement within one image ('frame') recall Étienne-Jules Marey's chronophotography. We can now see Marey's chronophotographic images as a Wittgensteinian relative of the chronocartography, or the cartography of time we are looking at here. In both, the overlay of multiple exposures of moving bodies within a single frame constitutes an anatomy—if not a cartography—of the body in motion.[26]

In the prominence of a tracing of surfaces and a folding of showing into exploring, I see a figuration of the argument I am articulating here. The film performs an analysis of the tensions between stillness and motion, between 2D and 3D, between representation and performativity, and between the

26 I want to point out this issue of still and moving image that we can approach from an indexical perspective. However, the scope of this essay does not permit me to expand here on the comparison of this still-animation in multiplicity, and the palimpsestic animation of Kentridge. On Marey and the index in this form of still-animation, see also Doane, 'Temporality', pp. 313-343, and Doane, *Emergence of Cinematic Time*.

optic and the haptic. In this sense, the slowly lingering and exploring camera invites, or even allegorically produces, a multi-dimensional 'textural' analysis—to take my cue from but also extend Jennifer Barker's proposal for this type of analysis via a tactile engagement with moving image—not just of the cave art but also of the movie images themselves.[27]

I contend that the movie experiments with performing a textural analysis of the cave as it investigates the texture and the dimensionality of the rock paintings. Moreover, it is the duration in movement and the experience of space in time that suggests a fourth dimension. In playing with dimensions, it tests the difference between line and volume, figure and materiality, stillness and animation. Moreover, the explorative character of the display of images and the ensuing haptic encounter with their texture may seem to reflect the often-made distinction between an optical distanced gaze that is contemplative and a haptic engagement at the surface, which is more experiential. And as Laura Marks has argued, such an engagement characterizes the specificity of optic versus haptic images.[28]

However, within a framework of exploration and experimentation as performative aspects of animation-in-navigation, this distinction is put under tension. At the heart of the visual regime of navigation, then, is the mobilization of haptic, dialogic relationality. It is in navigational and haptic engagement that the image becomes layered and animated. Fixatives of binary opposition and dualistic notions of difference, visibility, and knowledge, are challenged in this tracing at the surface.

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27   Barker, *The Tactile Eye.*
28   Marks, *Touch.*

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About the Author

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8.   Touch/Space: The Haptic in 21st-Century Video Art

Susanne Ø. Sæther

Abstract

Through the conceptual framework of the haptic, this essay charts a striking motif in much recent video art: the co-presence of a hand touching the screen and a distinctly layered spatiality. Critically deploying various notions of the haptic culled from film and media theory and perceptual psychology, Sæther discusses Trisha Baga's low-tech 3D video *Flatlands* (2010) and Victoria Fu's immersive video installation *Belle Captive I* (2012) and expounds a contemporary haptic space that verges between planarity and volume, between the near and far, and that exceeds the frame to enfold us. As Sæther argues, the salience of this motif points to the split between human sense perception and the networked, computational operations of 21st-century media, and the attempt to grasp this split.

Keywords: Video art, haptic space, haptic touch, atmospheric media, Victoria Fu, Trisha Baga

In an influential 1995 article, Antonia Lant discerned how a new spatial language emerged in early cinema during the first decade of the 20th century.[1] Cinema around this time passed from the relative still images of tableau-based scenes defined by layered sets, shallow spaces, and textured flatness into a cinema of temporal and spatial continuity, depth, and dimensionality. As Lant demonstrated, this passage was marked by a curious co-presence between different representational modes, each with their particular rendition of spatiality. Thus 'drawing, bas-relief, incised images, printed textile undulation, [and] moving human figures' were frequently

1   Lant, 'Haptical Cinema'.

juxtaposed, as were planarity and volume, surface and depth, emergence and recession, resulting in what she describes as a 'peculiar spatial ambiguity'.[2] With remarkable precision, Lant's description of cinematic spatiality at a transitional moment over a hundred years ago fits equally well with 21st-century video art. Surveying such art, particularly since around 2010, one again encounters a 'peculiar spatial ambiguity' wherein the shallow and the deep, surface and depth, plane and volume are juxtaposed, intriguingly and often conflictingly so. Thus a 'flat' desktop icon of a movie file might be layered over a photograph of the deep space of the universe, as in the opening image of Camille Henrot's acclaimed video *Grosse Fatigue* (2013). Or cardboard cutouts might be combined with flat-screen presentations of 3D printed objects of disparate anthropological origin, rotating against a green screen backdrop to flaunt their dimensionality, as in Mark Leckey's installation *The Universal Addressability of Dumb Things* (2013). That Henrot and Leckey's works were both exhibited at the Venice Biennale in 2013 attest to their traction in the art world.[3]

'Haptical cinema' is the term Lant gives to this spatially ambiguous instance of early cinema. She derived her notion of the haptic from 19th-century Austrian art historian Aloïs Riegl's distinction between haptic and optic perception and spatiality, developed to discern a shift from Egyptian to Late Roman art.[4] For Riegl, haptic qualities were associated with the close-range, tactile perception (*Nahsicht/nearsighted*) roused by the shallow spatiality of Egyptian art, while the optic—with its long-distance, disembodied vision (*Fernsicht/farsighted*)—was associated with the spatial depth and emerging perspective that developed in Late Roman art. 'Haptical cinema' is thus for Lant a cinema in which the plane and 'flat' spatiality of Egyptian art resurfaced in early cinema to mark the moment when it was about to explore a new spatial language of depth and dimensionality, and which drew attention to its own striking fluctuation between these different spatial modes.

Recent video art, too, charts the contours of a spatiality in emergence. This is a spatiality indigenous to digital screens in which software filters, desktop windows, and generic graphic effects pile upon each other at touching

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2   Ibid., p. 73.

3   Several examples from art critique, discourse, and curating from the last few years also attest to the perceived tension between flatness and depth in recent moving-image art, including the thematic film and video programme titled 'Flatness: Cinema after the Internet' curated by Shama Kanna for the International Short Film Festival in Oberhausen in 2013, and 'The Third Image – 3D Cinema as Experiment' programmed for the same festival by Björn Speidel in 2015.

4   Riegl, *Late Roman Art Industry*; 'Late Roman or Oriental'.

distance; in short, a kind of layered, incongruent, and proximate spatiality that pertains to a digital version of 'haptical cinema'.[5] However, the haptic qualities Lant discerned in early cinema are here further amplified by the salient motif of hands that physically touch the screen image and cause it to change.[6] Again and again, one encounters depictions of dismembered hands that tap, pinch, and swipe at the plane of the screen. These works thereby evoke a physical and lexical notion of the haptic understood as 'pertaining to the sense of touch' (OED), clearly impacted by the recent influx of touchscreen interfaces and their solicitation 'to touch in order to see', as Nanna Verhoeff has stated of touchscreens.[7] In Riegl's distinction as well as in most subsequent iterations thereof, the sensation of touch is, in contrast, activated without direct, physical contact.[8] Recent video art thus brings to the fore both an ongoing reconfiguration of on-screen spatiality in which the influx of haptic interfaces partake, and a tension between a metaphorical and a physical conception of the haptic as it has been applied in contemporary film and media theory. More specifically, such art charts an imbrication of the sensory capacity of touch with the spatiality of digital screens, and by extension, a relationship between the human sensorium and contemporary media machines that seems specific to the 21st century.

According to Mark B.N. Hansen, what sets 21st-century media apart from its predecessors is that, crudely summarized, with the digital computer as the general media platform, the circuits that link media and sensory perception and experience are interrupted. Crucial in this respect is the impossibility for the human sense ratio of perceiving what Wolfgang Ernst calls the 'technomathematical' operations of computers.[9] Simply put, our sense perception cannot grasp the micro-tuned operations of computational media. For Hansen, this split between human sense perception and what he calls the 'non- (or proto-) phenomenological, fine-scale temporal computational processes' is ultimately what defines the newness of so-called new (digital)

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5   I here rely on a notion of the screen forwarded by Anne Friedberg, who argues that 'the screen is not just a material object but also a material practice, which at once frames reality and represents a view of reality', and, significantly, 'a technology for representing space rather than a metaphor such as the window or a mirror', as summarized by Anne Jerslev. Jerslev, 'Screens and Time in David Lynch's Inland Empire', p. 2.

6   Importantly, the works are not themselves interactive or inviting the spectator to touch the work. Instead, they are installed like most works of contemporary artists' film and video—that is, either displayed on a flat screen or projected from front or back, in a black box or a white cube. Touching is here thus represented, and not experienced, by the beholder herself.

7   Verhoeff, *Mobile Screens,* p. 82.

8   Strauven, 'Early Cinema's Touchable Screens'.

9   Ernst, 'Media Archaeology as a Transatlantic Bridge', pp. 25-26.

media: 'the technical infrastructure of media is no longer homologous with its surface appearance'.[10] Moreover, with mobile computational devices such as iPads and smartphones, the 21st century has witnessed the emergence of ubiquitous computational networks whereby the computer has been distributed 'into the lived environment', making media 'atmospheric'.[11] While on the one hand, computational media can open up an 'expanded domain of sensibility that can enhance human experience', on the other hand, humans must rely on technologies to perform operations to which we have no direct access.[12] This, in turn, marks 'the culmination of a certain human mastery over media', as Hansen states.[13]

   Yet, with tangible screens and their intensified use of direct touch to operate the interface, this split between human sense perception and computational operations may appear less evident. Haptic computer interfaces, at least from the perspective of interface designers, 'are supposed to be able to activate users' tacit knowledge and everyday habits—including spatial orientation—while presenting the user with a surface cleansed from the computational complexity enabling them', as Timo Kaerlein has noted.[14] Mobilization of the sense of touch thus lends a sense of familiarity, immediacy, and mastery to media processes that ultimately eludes the human sense ratio. This, in turn, opens up an experiential and sensorial paradox of a decidedly spatial nature. On the one hand, the manner in which mastery is experienced is simply by touching the sleek plane of the touchscreen, thereby repeatedly confirming its confined, material flatness. On the other hand, this act of touching opens up the profound and ungraspable depth of the computational environment with which we are entangled. What the haptic interface so strikingly dramatizes is thus, simply put, how 21st-century media draws human bodies and senses quite literally up close, while its computational operations simultaneously become ever more elusive for our sensorium. It is within this conundrum that so much recent video art intervenes.

   In what follows, I examine the novel imbrication of touch—both physical and metaphorical—with the layered, incongruent spatiality brought forth in recent video art, seeing this imbrication as a distinctly contemporary

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10   Hansen, 'New Media', p. 178. Hansen here builds on and updates the split between media surface and underlying code influentially introduced by Lev Manovich in his book *The Language of New Media*.

11   Hansen, *Feed Forward*, p. 39.

12   Ibid., p. 4.

13   Ibid.

14   Kaerlein, 'Aporias of the Touchscreen'.

manifestation of the haptic. In order to do so, I put to work different concep-
tions of the haptic sourced from film and media theory, supplemented
by its use in early perceptual psychology. Rather than homing in on one
definition, I draw on the variable usages of the term to grasp the complexity
of the present entwinement of the sensory capacity of touch and spatial
construction. Two video works serve as my cases: Victoria Fu's double-
channel video projection *Belle Captive I* (2013) and Trisha Baga's l3D video
installation *Flatlands 3D* (2010). Formally, the works span from the polished
veneer of generic software and CGI to a seemingly analogue and fuzzy DIY
aesthetic, but they share the proximate, layered spatiality of Lant's haptical
cinema and depictions of acts of physical screen touching. As such, the works
flaunt a distinct interface aesthetics wherein the screen and its image are
figured as an interactive interface that translates between human input and
computational data-processing.[15] Whereas I see these videos as exemplary
of a much larger body of work, the exact kind of touch and the manner in
which touch is joined with layering are differently configured across the two
videos, thereby providing an instructive pair of cases. What is crucial is the
question of the degree to which touch is mobilized to master and control
the imagery and objects it handles. Based on the discussion of the works,
I conclude by outlining a set of sensory-spatial features that distinguishes
the emergent haptics of 21st-century video art.

Haptic Spatiality

First, however, a few notes on how film and media theory has expounded
the spatial dimension implied in the notion of the haptic. It was in his
book *Late Roman Art Industry* (1985 [1901])—published precisely at the
dawn of cinema—that Riegl introduced his distinction between a haptic
and an optical mode of perception. As applied in this book, the haptic was
associated with close-range, tactile perception (*Nahsicht/nearsighted*) and
the optic with long-distance, disembodied vision (*Fernsicht/farsighted*).[16]

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15   Søren Pold specifies that the purpose of an interface is to 'represent the data, the dataflow,
and data structures of the computer to the human senses, while simultaneously setting up a
frame for human input and interaction and translating this input back into the machine'. Pold,
'Interface Realisms', p. 2.
16   Riegl, *Late Roman Art Industry*. Riegl's book *Late Roman Art Industry* is regularly cited by
scholars as the major source for his distinction between haptic and optical, among them Gilles
Deleuze and Félix Guattari, *A Thousand Plateaus*; Antonia Lant, 'Haptical Cinema'; and Laura
U. Marks, *The Skin of the Film*. However, as Margaret Iversen and David Parisi have pointed

Riegl's teleological argument connected these habits of perception with the art forms of distinct historical epochs and their utilization of space and perspective. Haptic qualities thus characterized the shallow space (the space of low relief) and the impression of figures being concrete, material elements on a planar surface, creating a sense of solid object—thereby inviting touch—that he found to be typical of ancient Egyptian art. Optical qualities, on the other hand, described the rendition of deep, three-dimensional space and the perception of figures imbricated with (rather than being distinct from) this space as it was developed in Late Roman art. A binary scheme is thereby put in place between on the one hand, surface, planarity, proximity, nearsightedness, and materiality, and on the other, depth, volume, distance, farsightedness, and abstraction.

When subsequently taken up in film theory and analysis, however, Riegl's terms were altered with each new application. These alterations surely lead to some conceptual confusion, but as Lant has pointed out, the malleability of the terms also make them widely applicable.[17] In fact, each terminological turn seems to have had its own specific value for delineating aspects of the specific imbrication of space and touch brought to the fore by recent video art. Walter Benjamin was the first to apply Riegl's scheme to the moving image, if somehow implicitly. His 1936 essay 'The Work of Art in the Age of Mechanical Reproduction' is a kind of foundational text regarding the historically contingent role of media technologies for the habituation, reorganization, and training of our sensory apparatus, articulated in decidedly spatial terms. Whereas he never used the term haptic, Benjamin in this essay—as is widely noted—draws on Riegl's terms to discern a collective shift in perception wrought by technologies of mechanical reproduction.[18] This shift is wielded through a spatial opposition between optical 'contemplative

out, Riegl in fact never uses the term 'haptic' in that book but describes instead what he calls a tactile vision. It was in an article published the subsequent year, 'Late Roman or Oriental' (1902), that Riegl changed 'tactile' to 'haptic', referring to the recent introduction of the latter term in physiology, as noted by Parisi. In addition to being a more current term, the advantage of 'haptic' over 'tactile' for him was that the tactile was seen to imply 'an oppositional relation to the optic', whereas 'haptic' implied more of an interrelation. Iversen, *Alois Riegl*, p. 170; Parisi, 'Touch Machines', pp. 207-208. When I still refer to *Late Roman Art Industry* as the major source for Riegl's distinction, it is because it is in this work that he discerns in most detail the differences between the two modes of perception and spatial construction the term delineates.

17   Lant, 'Haptical Cinema', p. 67.

18   Benjamin, 'The Work of Art in the Age of Mechanical Reproduction', pp. 217-252. For discussions of the relationship between Benjamin's work and Riegl's scheme of haptic/optic perception, see for instance Hansen, 'Benjamin's Aura'; Lant, 'Haptical Cinema'; Bruno, *Atlas of Emotion*.

distance' and 'haptic nearness', as summarized by Miriam Hansen.[19] For Benjamin, Dadaist art and, most effectively, cinema reflected a historically specific desire for closeness through what he sees as cinema's 'tactile quality', based on the acute physical impact on the viewer of cinema's 'changes of place and focus which periodically assail the spectator'.[20] Cinema, in short, is experienced as a bodily—and thus, for Benjamin, tactile—shock that trains the spectators' sensory apparatus to adapt to a technologically changed and changing environment.

Recent re-readings of Benjamin's 'Work of Art' essay further foreground the spatial dimension inherent in his theory of media, which is also a theory of the technologically induced reconfiguration of our sensorium. Tobias Wilke has for example forcefully demonstrated how Benjamin in his original manuscripts for the 'Work of Art' essay used the term *taktisch* (tactic) and not the *taktil* (tactile) that it subsequently was corrected to by the editors of his collected writings, published in German in 1974.[21] What was lost in this philological adjustment, which has laid the ground for most English translations, was a conceptual ambiguity by which Benjamin deliberately integrates the *tactile* with the *tactic*—that is, touch is linked with the military term of strategic-spatial organization of forces to strike or to counter enemy attacks. What Wilke reclaims is thus how, for Benjamin, the embodied experience of touch was associated with an 'image of a spatial reorganization'.[22] Not drawing on military terminology but rather on the current traction in media theory towards the elemental, Antonio Somaini (2016) has recently identified in Benjamin's essay a spatially extended, 'environmental' notion of medium as the milieu in which human perception 'occurs' and is 'organized'.[23] He traces this spatial-elemental conception of medium back to the notion of *diaphanes* in Aristotle's treatise *De Anima*;

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19   Hansen, 'Benjamin's Aura', p. 352. However, as discussed shortly, Benjamin's favoured term in his original manuscripts was *taktisch* rather than tactile or haptic.

20   Ibid., p. 238.

21   Interestingly, Wilke notes that one of the reasons put forward by the editors for this philological intervention was to bring the term *taktisch* in congruence with Riegl's employment of the term in his *Late Roman Art Industry* (1901), a work that Benjamin's essay is commonly seen as strongly influenced by. In the reception of Riegl's work, however, the ambiguity of his original term is generally undermined in favour of an understanding of it as relating to the sense of touch rather than tactics, due partly to its oppositional entwinement with the optic and partly to Riegl's subsequent adjustment of the *taktisch* to *haptic* (which is commented upon also later in this chapter), to foreclose the ambiguity of the former term. Wilke, 'Tacti(cal)ity Reclaimed', p. 48.

22   Wilke, 'Tacti(ca)lity Reclaimed', pp. 42, 46.

23   Somaini, 'Walter Benjamin's Media Theory', pp. 9-25.

diaphanes being the transparent yet still felt intermediary substances that occupy the space between the human body and objects perceived. As such, the *diaphanes* serve as transmitters for perception: it is through their presence that perception is possible.[24] Air, water, smoke, clouds, and crystals are some examples of such diaphanous substances.[25] In spite of their obvious methodological and theoretical differences, both Wilke and Somaini foreground the spatial-perceptual reorganization at stake for Benjamin in ways that are keenly resonant with the resurgence of the haptic in recent video art.

A much later and very different reversal of Riegl's terms was introduced in film studies by film historian Noël Burch (1990). Employing the haptic as a distinctly spatial term, he traces the development of the 'bourgeois realism' that in his view came to dominate cinematic representation during the first three decades of the 20th century. For Burch, a key component in this representational mode was the evolution away from the contradiction between flatness and depth that he found had marked cinema in the first decade of this period, and towards the rendition of deep, realistic space through implementation of perspective and three-dimensional figuration. Defining this believable deep space was the experience of a spatial illusion of solid, graspable actors and objects that he deemed haptic. This was, in short, a cinematic space that demonstrated that 'it all can be entered and touched'—for Burch, a 'haptic space'.[26] Construction of space, the tension between surface and depth, and the impression of a represented object being touchable lay at the core of Burch's notion of the haptic, as it did for Riegl. But as Lant has criticized, the deep, realistic space that Burch considers haptic in Riegl's scheme does in fact define the optical mode.[27] Burch thus completely inverts the distinct spatial modes that Riegl's terms originally conveyed.

Lant's own notion of 'haptical cinema' takes seriously both the particular art historical discourse that Riegl endorsed and the particular spatial organization of Egyptian art that he discussed, as she retraces its features of textured flatness and a layered and shallow space in a set of films from the first decade of the 20th century. Here, layers of curtains, painted décor pieces, and superimpositions precluded the illusion of perspectival depth

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24   Ibid.
25   Somaini, 'Walter Benjamin's Media Theory'; Krämer, *Medium, Messenger, Transmission*, p. 32.
26   Burch, 'Life to Those Shadows', p. 172.
27   Lant, 'Haptical Cinema', p. 71.

and produced a shallow and incongruent space. Early cinema abounded with pharaohs, sphinxes, and pyramids, and Lant uses these Egyptian motifs as a prism through which the emergence of a new spatial language of depth and volume in cinema can be clearly discerned: this was, as noted, a 'cinematic passage, from the still and planar to the moving, jarring, intruding, and voluminous'.[28] Based on what she sees as a fundamental bipolarity between cinematic flatness and depth, she develops a 'historically grounded model of film based on the plane of a non-perspectival space', as succinctly summarized by Giuliana Bruno.[29] Likewise, the haptic space posited in this essay rests on a historically situated model of contemporary screen media in which the flat and non-perspectival space of the early screen is both replayed and replaced by the post-perspectival space of the digital screens that pervade the 21st century, if now uncoupled from the Egyptian motif.[30]

Both building on and departing from Lant is Laura U. Marks' widely influential notions of 'haptic images' and 'haptic visuality', which, as for Lant, are concepts that designate both a perceptual and spatial mode. Launched in a number of texts from the early 2000s, these notions designate an intimate relationship between viewer and image produced by degraded, grainy, blurry, or low-definition imagery, which perceptually may appear simply as abstraction or texture.[31] Rather than inviting a look that 'plunges into depth', as Marks formulates it, haptic images draw attention to their material and surface qualities: the grains of the film, the lines of the analogue video tape, the pixels of digital video. Haptic images thus appeal to senses that they technically cannot represent, with touch in a privileged position: they are, in short, images that invite a kind of 'touching with the eyes'.[32] Crucial for Marks is that the intimate relationship between viewer and image invited by such imagery implies an abdication of the mastery and control associated with optical/visual beholding: vision is engaged in acts of 'touching, not mastering'.[33]

While each of the above has their specific take on the haptic, what these different accounts (with the exception of Benjamin's) of the tactile/haptic in film and media theory share is that, while they acknowledge and foreground embodied and multisensory cinematic experience, their conceptions of

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28 Ibid., p. 72

29 Bruno, *Atlas of Emotion*, p. 250.

30 Anne Friedberg employs the term 'postperspectival' in her seminal book *The Virtual Window. From Alberti to Microsoft*, pp. 7, 22, 194-210.

31 Marks, *The Skin of the Film*, pp. 127-194; *Touch*.

32 Marks, 'Touching with the Eyes'.

33 Marks, *Touch*, p. xii.

touch and the haptic are still 'folded into a model of visuality' as David Parisi has remarked.[34] A predominantly visually grounded model of the haptic has proved to be a rich addition to film and media theory and analysis; it also productively accounts for relevant aspects of the video works under examination here. Yet this model falls short when considering the specificity of the new haptic space as charted in recent video art, since this is a space that also elicits acts of literal screen-touching. Perceptual psychology as well as recent studies of new media and, more specifically, digital, multisensory interfaces provide supplementary conceptions of touch and the haptic, since they tend to address precisely the practice of actual screen touching.[35] In general, 'haptics' and 'the haptic' are in this line of work used respectively to describe a particular sensory category or mode of sensory perception and/or as an adjective to describe qualities of new media technologies, environments, and works of art.[36] In the following, I therefore pursue a notion of the haptic that allows for the variety outlined above, finding productive dimensions across it. Still, Lant's employment of the term for the spatial language of early cinema holds a pivotal position for grasping the specific entwinement of haptic space and touch encountered in so much recent video art, as does Marks' notion of haptic visuality, updated to the sensorial requirements of the present. In turning to the works, I accordingly explore how layering (Lant) and blurring (Marks) play out and intertwine, as well as the exact types of touch evoked, seeing that it is in these very interrelations that the distinctiveness of the haptics of 21st-century video art is found.

Grasping Haptic Space: Stacked and Atmospheric

Victoria Fu's double-channel video installation *Belle Captive I* (2013) effectively stages the tension between the optical-metaphorical and physical conceptions of the haptic, summoning a spatiality that both enacts and troubles the dyadic scheme between far and near, flat and deep, vision

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34   Parisi, 'Touch Machines', p. 65.

35   Both the tactile and the haptic (frequently used interchangeably) are in these fields generally understood in their lexical sense—that is, as respectively, 'perceptible to the touch, tangible' and as 'of the nature of, involving, or relating to the sense of touch' (*OED*).

36   See for instance Paterson, *The Senses of Touch*, pp. 127-147. However, also in these contributions from new media and interface studies, metaphorical and polysemic notions of 'touch' figure frequently, yet these metaphors are grounded in the physical act of touching rather than the optical evocation of it.

and touch on which Riegl's legacy rests. Here Fu has sourced green-screen stock footage from the Internet. Originally created for commercial use, the footage shows a series of mundane objects and people performing everyday gestures and expressions. We see, for instance, a woman drinking a glass of water, a man flexing his back muscles, a parrot, a rotating tomato, a dog drinking water, the face of a smiling boy. Fu has then cropped, blurred, layered, and looped these elements in an editing programme. Further removing them from their original contexts, she has piled the imagery onto original 16mm film footage of sunsets, including textural distortions inherent in the analog medium, such as light flares and film grain. Regularly intervening in this imagery is a hand that swipes, taps, and pinches at the plane of the screen, attempting to instigate an action or change in the image. Installed, this imagery is projected on and beyond a freestanding wall, spilling over onto the back of the gallery. Blending with this is a second projection that fills the back and sidewalls of the gallery space, showing the same 16 mm sunset scenes but refracted through prisms.

In *Belle Captive I*, the layered, incongruent spatiality so pivotal to Lant's haptical cinema plays out in equal parts within the work's imagery and across the physical space of the gallery. Looking first at the imagery, it is as if each depicted element is isolated in its own spatial layer and relegated to strictly 'demarcated planar zones', to use Lant's own description.[37] Already within the first few seconds, this spatial construction becomes evident. The work's initial image is the artist's filmed sunsets: a series of passing hues of pink, purple, and yellow. Upon this background is inserted the upper half of the expressionless face of a young man, peeking over the lower edge of the image frame. A female hand enters the image to be layered upon the face, its fingers performing a pinching gesture. Yet, rather than shrinking the face, as expected from our habituation with codified touch screen gestures, the eyes narrow as if smiling. Here, three distinct planes layer up: the sunset background, the face that seems fully unbound from the background, and the hand that, while somehow interacting with the face, still operates on yet another spatial plane—that of the screen. These layers frequently change positions, thereby installing a sense of pulse and rhythm. Fu's own sunset recordings serve as the more or less stable backdrop upon which parts of faces, human bodies, plants, objects, insects, and animals amass and interchange. As in the Egyptomanian cinema that Lant explores, spherical objects recur—a tomato, an apple, a head—turning and rotating to display

37   Lant, 'Haptical Cinema', p. 55.

their surface variations as well as their volume.[38] Dimensionality is thereby pitted against the planarity of the screen, which is reinforced through the hand that recurrently touches its plane.

Seemingly paradoxically, dimensionality and depth are also assumed through flatness. Through the trope of layering, *Belle Captive I* builds depth through stacking distinctly 'demarcated planar zones' upon each other. A similar spatial logic of the screen was introduced in the 1970s and early 1980s with the development of the windowed graphical user interface of the computer. As Anne Friedberg has noted, the 'window' of the GUI is also a 'component of a mixed metaphor: a window and a desk'. As such, it is characterized by '[s]tacking windows on top of each other, piling documents in layers', whereby the 'space mapped onto the computer was both deep and flat'.[39] In *Belle Captive I*, this co-presence, and indeed co-constitution, of depth and flatness is further intensified. Rather than a perspectival ordering of near and far along a singular vanishing point, we here encounter a stratified space, wherein each layer seems to operate independently of each other with its own spatial codes and scales. Yet in *Belle Captive I*, these layers are nonetheless integrated so that they together establish a composite image that in its spatial organization pertains to the computational model of 'the stack'. Since the 1970s, in computer science, 'the stack' has served as the governing conceptual model for conceiving of 'interactions and dependencies between digital system components like protocols, data formats, or software' or, in short, for 'organizing processes and data', as summarized by Till Straube.[40] Hence, Fu's work reiterates in a pictorial language not only an aesthetics of the computer interface but also the (imperceptible) computational infrastructure that this interface depends on. Epitomizing this spatial logic of depth through flatness, and the planetary scaled through the infinitesimal, is the constant backdrop

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38   Lant, 'Haptical Cinema'. Tom Gunning has also recently noted the importance of rounded and spherical objects for the establishing of depth and dimensionality in early cinema. Gunning, 'Rounding Out The Moving Image'.

39   Friedberg, *Virtual Window*, p. 227.

40   Straube, 'Stacked Spaces', p. 5. More recently, however, the conceptual model of the stack has migrated beyond the realm of 'communication standardization and technical specification to serve in media studies and the social sciences as a tool for critical analysis' of information and communication technologies and infrastructures. (Ibid.) Benjamin Bratton has, for example, with great influence employed the model of the stack to 'computing at large', positing the stack as 'geo-political megastructure organizing planetary space and society', while also using the stack as a tool for 'dissecting a vertically integrated, dynamic, heterogeneous assemblage' of metaphoric layers, such as the cloud, the interface, and the user (ibid.). Bratton, *The Stack*.

of Fu's pinkish sunsets. Appearing as ambient colour field images, they serve as default computer desktop backgrounds, evoking at once the awe-inspiring infinity of the heavens and the banal planarity of the computer screen.

Inherent in this doubleness of the heaven/desktop background is also a flattening that is not merely perceptual but extends to the ontological status of the entities featured in *Belle Captive I*. The living and the non-living—humans, animals, plants, and things—here all perform their miniscule, repetitive actions in their own rhythm, scale, and spatial layers: twisting and turning, smiling and waving, stretching and bending, drinking and blinking at their own accord, they almost literally enact the 'flat ontology' proposed by Manuel De Landa. As De Landa explains, a flat ontology is not grounded in a relational and hierarchical order in which each level represents a different ontological category but is 'made exclusively of unique singular individuals, differing in spatio-temporal scale but not in ontological status'.[41] Hence, the bottom half of the tomato that we see rotating in the upper-left corner of the frame in the beginning of the work operates on par with the muscular, naked back of a man stretching left and right under layers of blurry greenery in the middle of the work, as do the bees that soon flank the right edge of the image, and the coffee beans that fill it just after. Any such ontological flatness appears to be further deflated by what Fu has described as the 'one-size-fits-all, generic flatness' of the green-screen captured 'individuals' that populate the corporate infosphere and beyond.[42] Undergirded by networked flows of capital, this footage is produced to fit any kind of background and situation; bland, neutral, interchangeable, and transferrable as it is.

Through the work's installational features, *Belle Captive I* gives physical body to the spatial layers in a manner that enforces the work's interface aesthetics. With the imagery from the one projection exceeding the edges of the freestanding wall, a twisted and fractured version of the windowed graphical user interface of the computer screen is summoned. Whereas no desktop 'windows' are depicted in the work, the freestanding wall and the mismatching image projected onto it strikingly appear as such, evoking a pile of frame upon frame that effectively enacts the trope of stacked computer windows, as described by Friedberg.[43] Adding to the stack is the shadow thrown at the back of the gallery space by the freestanding

41   De Landa, *Intensive Science & Virtual Philosophy*, p. 47.
42   Fu, *Whitney Biennial 2014*.
43   Friedberg, *Virtual Window*, p. 227.

16. Victoria Fu, *Belle Captive I*, 2013. Video installation with sound, 06:00 loop. Exhibition view, Whitney Biennial. Whitney Museum of American Art, New York, 2014. Courtesy of the artist.

wall, which thus appears as yet another 'window'. Walking around the installation, the ambiguity between deep and flat is further dramatized and indeed literalized, since our peeking around the freestanding wall effectively confirms it as such; a plane from which the projected image bounces back and overflows. Yet, this wall's tangibility as an object and its distance from the back wall onto which much of the imagery spills provides spatial extension and, indeed, depth to the video installation. *Belle Captive I* thus subtly but efficiently negates the present imperative of the interfaced image to 'fit to frame', in Stephen Monteiro's succinct phrase. As Monteiro expounds: 'The image becomes eminently convertible in contemporary interfaces, there to be stretched, compressed and rotated to conform to all manner of screen frames in proliferation of formats and dimensions developed for any number of devices and browsers.[44] In Fu's work, in contrast, bodies, heads, creatures, and objects are consistently cropped—a forehead here, a snout there, then half a tomato—rather than stretched, mutated, or compressed to fit the frame. Likewise, the ratio of the projected imagery does not match the freestanding wall that serves as projection screen. Here the interface is simply not contained by the screen but profoundly exceeds its limits. In Fu's work, the driving logic of the (haptic) interface towards immediacy is augmented and

44   Monteiro, 'Fit to Frame', p. 60.

played out across the physical space of the gallery.[45] Thus, the interface is turned into a pastel-coloured atmospheric environment whereby screen space is staged as simultaneously engulfing and as a panel for control; an informational abyss in which to lose oneself and a contained plane to directly manipulate—the Latin prefix 'mani', of course, referring to the hand.

The blurring that Fu has subjected the stock imagery to through software-based image processing and filters evokes the haptic visuality that Marks has theorized; that is, the 'touching with the eyes' invited by heavily textured or unsharp film or video images.[46] Sometimes the blur is slight, at other times profound to the extent that figure merges with ground and the imagery approaches full abstraction. For example, at one stage the unsharp white lilies of the top image layer fuse with the light blue sunset at the back, while the equally blurry stalks and dark greenery that spread from the flower across the image entangle with the shadowy areas of the naked back of a man as he stretches and bends his torso in an in-between image layer. Seconds later, a girl's neck and clothing in the top layer are fully subsumed into the background as her features are dissolved by a zoom and her skin tone merges with the sunset behind. In parts of the work, 'figures cannot be clearly distinguished, and layers of images move in an uncertain relation to the plane of the lens', to reemploy Marks' own description of a decidedly haptic film.[47]

For the haptic qualities of *Belle Captive I*, the blurring has two implications. For one, it serves to soften the 'demarcated planar zones' that mark the work, establishing a frail continuity between its different spatial planes. Indistinct contours, zooms, colour fusion, and abstraction temper the differentiation between planes. Significantly, this allows the spatial planes to temporarily meld into each other, marking them as pliable and permeable but without erasing the governing spatial trope of layering. In addition, blurring here invites the intersubjective intimacy that Marks identifies with haptic visuality. Following Marks, a significant consequence of this intimacy is the abdication of optical mastery over the image, whereby 'the viewer relinquishes her own sense of separateness from the image'.[48] In Fu's work, the digitally filtered texturality of foliage and feathers, sculpture and snout,

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45   As Kaerlein and others have made clear, interface design generally strives to fulfill the dream of the transparent interface. Kaerlein, 'Aporias of the Touchscreen'.

46   Marks, *The Skin of the Film*, p. 175.

47   Ibid., p. 181. Marks here describes Seoungho Cho's film *Identical Time* (1997).

48   Ibid., p. 183

combined with the ambient and immersive qualities of the installation laid out in physical space, surely denies the viewer the distanced overview and possession that optical beholding allows. Emerging instead is a profound sense of our embodied entanglement with the computational environment in which we live, here partly brokered by the interface.

If the haptic visuality and proximity brought forth in *Belle Captive I* may signal the dismantling of optical mastery, this position is complicated when considering the precise nature of the acts of physical touching shown in the work. Here, the hand and its index finger repeatedly attempt to explore and interact with the entities depicted through touching them. The hand in *Belle Captive I* is more specifically featured as an organ of what James J. Gibson in his classic study of the psychology of touch termed active touch, i.e. 'self-produced movement that allows the perceiver to obtain objective information about the world'.[49] In this context, 'objective' refers to percepts that are experienced to be 'out in the world' rather than the 'subjective' sensations they produce in the subject, the objective and subjective however being conceived as poles on a continuum. It is this exploratory and manipulative mode of touch that in psychological terminology is generally termed haptic.[50] On the face of it, the hand that repeatedly touches and intervenes in the image apparently does so precisely to explore, control, and operate it. With formatted gestures known from haptic interfaces, it pinches to cause a face to smile, swipes to set the sculpture in motion, taps to shift a background image. Haptic visuality and haptic touch thus seem to be at odds. Mastery is optically dismantled only to be reinstalled haptically. Following the lure of the haptic interface, the acts of touching in Fu's work here seem to 'suggest tangibility where there is little to none', and thereby to install a sense of control over the profoundly inaccessible computational processes these touches instigate.[51]

Yet again at other times, nothing happens with these touches, or something does, but the outcome is quite unexpected. While the exceptionally blurry sculpted head in bronze responds to a finger-swipe at the plane of the screen by rotating, as if dragged into motion by the touch, a later swipe undoes this causal relationship between touch and response when a woman's torso stubbornly at first does not react to it, before then slowly starting to

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49   Schiff and Heller, *The Psychology of Touch*, p. 7.

50   Tactile, on the other hand, is reserved for being touched, or what Gibson designated passive touch—'"sensations" resulting from stimulation of passive skin receptors'—and for situations when the skin is touched by an object and does not move around to explore. Schiff and Foulke, *Tactual Perception*, p. xi.

51   Kaerlein, 'Aporias of the Touchscreen'.

rotate but now in the opposite direction from the swipe. In these cases, a lack of haptic mastery of the image and its space is efficiently demonstrated. Towards the end, a yellow cockatoo sits in a human hand as a pointed index finger enters at the plane of the screen to repeatedly tap and swipe at the bird, with no result. Yet when a second hand enters to stroke the cockatoo, now seemingly beyond the plane of the screen, the bird promptly responds by biting at the hand. What this illustrates is that the world haptically explored in *Belle Captive I* is one that is fundamentally enfolded and unfolded by the screenic interface, conceived as a 'liminal threshold condition' that is as mutable as it is pervasive.[52] In short, the haptic condition we encounter in *Belle Captive I* is one in which the sensory capacity of touch is mobilized to explore, manage, and control our data-rich surroundings, yet where the capacity of touch to work as such a tool is rendered profoundly unstable. Corresponding to this unstable sense of touch is a proximate space in which distinct spatial layers continuously verge on being dissolved through blurring and abstraction, drawing the spectator up close in the process. As is the case in haptic interfaces more generally, in Fu's work 'input and output spaces are no longer separated but rather converge', yet here this converged space expands beyond the plane of screen to fill the gallery space with its ambient pastel hues.[53] Fu's self-recorded sunsets thus, in an almost literal iteration, signals the condition of 'atmospheric media', posited by Hansen, wherein human agency is dispersed across and configured by the networked, computational media that make up our contemporary living environment.[54]

Seizing Hyperhaptic Space: Pliable and Diaphanous

The atmospheric media condition evoked in Fu's work is further intensi- fied in Trisha Baga's video installation *Flatlands 3D* (2010). *Flatlands 3D* is a nearly 17-minute-long, single-channel 3D video installation projected onto the back wall of an enclosed gallery space. Hands—and occasionally feet—that appear from the margins of the image frame to manipulate figures and objects on the image plane is a recurring motif also in Baga's work, consistently rendered in 3D. Here, this motif is layered upon home

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52 Hookway, *Interface*, p. 5.
53 Herrlich, Walter-Franks and Malaka, 'Daten zum Anfassen', p. 135, quoted in Kaerlein, 'Aporias of the Touchscreen'.
54 Hansen. *Feed-Forward*, p. 5. See also Bruno, 'Screen as Object', for a brief historical genealogy of the atmospheric dimensions of projection in art.

video recordings of urban and cultural landscapes shot at different scales and angles, such as rain-wet streets, a highway landscape seen from a car window, grassy meadows, and an aerial view of a city by night, combined with generic found imagery and recordings from various interiors such as the artist's own studio, bars, and a sports hall. Throughout the work, these environments are perceived through (optical) filters and semi-transparent and reflective surfaces, including water, mirrors, windows, and screens, as well as effects indigenous to both 'old' and 'new' media: from the 'snow' of a noise-ridden analogue television set via a blue filter placed in front of a projector, to the spatial compositing indigenous to digital imaging. In contrast to the generic, smooth, and wholesale digital appearance of the stock footage and software effects featured in Fu's work, Baga's work has a distinct DIY aesthetic. Here digital automated techniques are combined with markedly manual ones, such as circulating a flashlight above a floor of scattered CDs to produce kaleidoscopic patterns of reflections. In front of the projection to the left is placed a disco ball, somewhat of a signature for the artist's video installations. As the ball catches light from the projector and scatters it around the gallery space, the light merges with 3D effects to create an immersive environment. While sharing with Fu's work the key features of layering, blurring, and acts of screen touching, the kinds of touch evoked and the nature of the space produced differ.

Flatlands 3D takes its title from Edwin Abbott's utopian short story *Flatland: A Romance of Many Dimensions*. Written in 1884, this social satire deals with a world whose inhabitants are shaped in two-dimensional, geometric forms and are subject to a strict, hierarchical caste system: women are lines, men are polygons with various numbers of sides, labourers are triangular, and so on. The narrator of the story is a square who dreams of visiting Lineland, which is inhabited by 'lustrous points', but ends up instead visiting Spaceland and Pointland. Baga's *Flatlands 3D* is not a direct adaptation. Her protagonist seems, for instance, to be a lustrous point—consistently rendered in 3D—that we follow throughout the work, whereas vibrantly coloured squares, triangles, and rectangles appear irregularly. Instead, Baga transports Abbott's play with dimensions to the setting of 21st-century media where the relationship between proximity and distance and planarity and depth as brokered by contemporary screens is undergoing substantial reconfigurations.

Like in Fu's work, layering is pivotal in *Flatlands 3D* and is a compositional principle that runs throughout the work. For example, about five minutes into the work, we see a landscape dominated by trees and foliage in the background, upon which is layered a butterfly in close-up. On top

17. Trisha Baga, *Flatlands*, 2010. Video, disco ball, 3D glasses red/cyan, 18:00, Dimensions variable. Courtesy of the artist and Greene Naftali, New York.

of that is superimposed another layer of the vibrantly coloured, geometric figures that recur throughout the work. A foot seen from above appears to step atop of this already composite image, both foot and figures rendered in 3D. As emphasized by Lant in her discussion of early 'haptical cinema' and seen in the discussion of Fu's work, layering—whether of wooden décor or software filters—may produce a haptical quality through the densely textured imagery that results and its curious fluctuation between spatial depth and flatness. This is also the case here. In *Flatlands 3D*, flatness is repeatedly emphasized, in that each layer comprises a discrete spatial plane whereby perspectival depth in the resulting overall image is precluded. Planarity is further accentuated by the various depictions of acts of screen touching through which the image plane is figured as a level, responsive surface. A later sequence epitomizes this imbrication of planarity, proximity, and surface with responsiveness to touch. Here the 3D-rendered lustrous point that we follow through the work is momentarily framed by a black rectangle painted on a white wall, the wall being a paradigmatic example of a flat surface. Temporarily acting as a touchscreen, the rectangle is briefly tapped by the artist's index finger, the lustrous point thus intermittently serving as an interface icon. Physical touch here confirms the flatness of the makeshift screen. Simultaneously, as identified in Fu's work, this consistent layering of image planes necessarily implies a stacked and thereby deep space. This is the post-perspectival, stratified

space morphologically associated with the very 'materiality organizing principle of digital information'.[55]

Baga's idiosyncratic deployment of 3D augments this layered co-existence of flat and deep and thereby also the work's hapticity. Her 3D technology of choice is the anaglyph, whereby each eye's image is encoded by glasses using filters of different (usually chromatically opposite) colours, typically that of red and cyan as the case is here. Already in the very first image of the work, a subtitle asks us to 'Please. Please. Put on your glasses.' Having done so, we are transposed into an enchanted universe full of 'intersecting objects, each encounter unfolding at its own pace', as described in one review.[56] Significantly, the artist consistently prioritizes negative parallax, i.e. the impression that objects appear closer than the plane of the screen and thus exist in the space between the screen and the viewer. Positive parallax, in contrast, elicits depth effects by deepening the space beyond the plane of the screen. Strikingly, the artist's hands and feet are consistently rendered in negative parallax as they irregularly intervene to interact with the image, thereby punningly literalizing the 'urge to touch' that 3D films routinely are seen to produce.

Among well-established negative parallax techniques are emergence effects, which produce the experience of entities protruding from or moving towards us from the plane of the screen. In 3D cinema, such effects have conventionally been playfully utilized to provoke shock and surprise, the paradigmatic case being an object being flung towards the viewer across the threshold of the screen, potentially triggering the sensory-motoric impulse to duck. In *Flatlands 3D,* we find no such things. Emergence effects are here instead subtly employed for ephemeral elements like the static 'snow' displayed on an analogue television set, (proper) snowflakes, rain drops, and light reflections that appear to 'float' across or from the screen to seemingly hit our bodies. In her signature DIY style, Baga is here employing 3D effects in line with recent mainstream 3D filmmaking, where digital image processing tools are employed to let computer-generated, fleeting objects 'gently glide through' the space of reception, as Kristen Whissel and others have pointed out.[57] Indeed, in *Flatlands 3D*, fleeting natural and

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55   Forlano, 'Towards an Integrated Theory of the Cyber-Urban', p. 79. It should be remarked that Forlano in this article argues *against* a rhetoric of layers in discussing the organization of digital information.

56   Kerr, 'How to Understand the Pioneering Work of Trisha Baga'.

57   With reference to work on 3D cinema by Barbara Klinger and Ariel Rogers, Whissel discusses this development in digital 3D cinema's employment of emergence effects in her essay in this book.

medial elements fuse with the light reflections from the disco ball to saturate and fill the space between the plane of the screen and the viewer, thereby seemingly expanding the dimensionality of the image. It is as if space itself has acquired a volume of sorts, underscoring the lack of separation between figure and ground, media and environment.

Curiously both enhancing and punctuating the impression of depth and volume is Baga's consequent rendering of the vibrantly coloured, geometric figures in 3D, as these are—in line with her signature low-tech, do-it-yourself style—produced from pieces of cut paper. Lacking a third dimension, squares, rectangles, triangles, and points pervade and hover in front of the screen and expand screen space into the physical space of the gallery with still another layer. Yet these geometrical figures flaunt their two-dimensionality by occasionally flipping and turning, so that we catch glimpses of their 'profiles' as being literally paper-thin. Impressions of three-dimensionality and volumetric spatiality are thus contrasted, and the planimetric is underscored. The fact that Baga defies positive parallax and its depth effects, whereby objects are perceived as occupying space beyond the plane of the screen, also pushes our attention towards proximate space and the images' foreground.[58] In short, contrary to its mainstream use, in which 3D is generally employed to expand screen space both in front of and beyond the screen to maximize depth effects, Baga here deploys 3D to accentuate spatial flatness as much as depth, planarity instead of volume, proximity rather than distance. What results is an incongruent and proximate spatiality that reiterates the core tenet of Lant's notion of 'haptical cinema' in a contemporary screen vernacular.

Miriam Ross has convincingly argued that contemporary digital 3D films tend towards what she terms hyperhaptic visuality: an intensifying of the haptic perception that Marks finds in unclear, degraded, heavily textured, or pixelated imagery that draws attention to its materiality. Whereas digital 3D imagery in contrast is generally clear and defined, what in Ross' understanding causes its hapticity is that the images presented have 'no determined central plane and instead suggest a malleable and porous screen space'.[59] Through this process of 'making the framing of the screen violable and open to play', Ross notes, the 3D film places the viewer in a position

58   Positive parallax is commonly used in tandem with negative parallax and to render various kinds of 'deep' space. When used in this way, emergence effects generally produce an impression of spatial continuity and thereby (perspectival) depth, since we can follow objects as they approach us along the z-axis on both sides of the threshold of the screen. When this is not the case, the space in front of the screen and its surface qualities is given priority.

59   Ross, 'Hyperhaptic 3-D', p. 384.

of 'touching, not mastering' in Marks' phrase.[60] This observation also holds for Baga's deployment of digital 3D techniques through which screen space is unbound from a fixed plane and frame. However, *Flatlands 3D* adds texture and blur to its 3D imagery, thereby amplifying its hapticity further. Throughout the work, Baga repeatedly interlaces semi-transparent layers of, for example, patterned textiles such as pants and carpets; natural elements like a night sky, earth, and foliage; and a range of low-tech optical filters and effects. What results is precisely the kind of densely textured imagery that Marks has identified as haptic, and, accordingly, the demounting of visual beholding and mastery of the image.[61] Perceptual hapticity is thereby further amplified: not only does the work's 3D effects induce a malleable and volumetric screen space that escapes containment by the frame, thereby soliciting the sense of touch, its textured qualities simultaneously draw attention to the material presence of the image.

Flatlands 3D in effect foregrounds the media saturation of our everyday milieus. Through its consistent merging of medial filters and artefacts with natural elements, the work summons an almost literal evocation of recent media theoretical conceptions of the elementality of media. As John Durham Peters has noted, natural elements such as air, earth, and water and the environments they constitute increasingly take on medial functions, while simultaneously digital devices, touchscreens among them, 'invite us to think of media as environmental, as part of the habitat'.[62] Through their portability and computational capabilities, such devices provide access to various environments and are themselves part of and make up our lived environments. In this sense, media are as fundamental to our 21st-century environment as the four elements water, air, earth, and fire. Moreover, as Mark B.N. Hansen has argued through his notion of atmospheric media, with networked, computational processes increasingly being distributed into the lived environment, our own sensory perception is to an unprecedented degree entangled with medial processes operating at scales (both micro and macro) that elide direct perception, yet that imbricate human experience with such 'environmental networks'.[63] In Baga's installation, drops of rain, the 'snow' of the television screen, stars from the patterned carpet, and flakes of sleet protrude from the plane of the screen to intermingle with the light

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60   Ibid; Marks, *Touch,* p. xii, quoted in Ross.

61   Indeed, Riegl served as a curator of carpets in his tenure at Österreichisches Museum für Kunst und Industrie, being a connoisseur of textures and textiles.

62   Peters, *Marvelous Clouds*, pp. 4-5.

63   Hansen, *Feed Forward*, pp. 38-39, 64-65.

reflected from the disco ball in the gallery space. This merging of medial and natural elements evokes the atmospheric qualities of contemporary media as described by Hansen and appears to enrapture us in the 'environmental networks' that affect our minds and bodies.

Flatlands 3D also depicts several instances of actual, physical touch. As is the case in Fu's work, these are instances of active, explorative, and thus haptic touch, if following the terminology of perceptual psychology. We see hands, and here also feet, in stereoscope intervening in the image to manipulate, explore, and move objects around. At one point, Baga's hands reach into the plane of the screen in attempting to move a plastic ruler superimposed upon a shot of the clear-blue sky, as if to measure it. In an early sequence, a sock-clad foot steps upon a floor-carpet patterned with stars and planets to adjust one of the colourful pieces of cut paper scattered across it. Later, her index finger intervenes in the image to (unsuccessfully) move a subtext from the bottom to the top of the image. Mundane and sublime, finite and infinite, material and immaterial, organic and inorganic objects and entities are handled on the same accord. As tongue-in-cheek as poetic, like in *Belle Captive I*, these instances of physical touch in *Flatlands 3D* are fundamentally ambiguous with respect to human mastery, striving for command over computational processes that vastly exceed human sensory capacities and agency.

Such instances of active and (seemingly) manipulating touch, however, are here supplemented with another mode of touch evoked experientially rather than depicted, yet that is equally defining for the 21st-century haptic condition charted in Baga's work. This is what David Katz in *The World of Touch* ([1925]1989), one of the foundational monographs in the psychology of touch, called 'film touch'.[64] Designating a particular kind of touch that results from the touch organ being immersed, it can be explained as the experience of 'drawing the hand through water or a thick liquid'.[65] Film touch, in short, refers to the sensation of touching not an object but a substance wherein the 'resistance the material offers the hand is experienced as elastic rather than stiff or rigid'.[66] In contrast with the determinate and

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64 First published in German in 1925, Katz's book was first translated into English in 1989. Katz here introduced three modes of touch, modeled on an analogy with the visual perception of colours. In addition to film touch, the other two are surface touch and volume touch. Film touch is thereby the haptic equivalent of the visual impression of colours, what Katz calls 'film colour', produced when watching a projected film: the experience that colour cannot be precisely located in an object or surface and thus has no definite location in three-dimensional space.

65 Krueger, 'Tactual Perception in Historical Perspective', p. 35.

66 Ibid, p. 36.

bounded form of an object, film touch arises with an indeterminate form that lacks a rear boundary enclosing it but that displays a certain 'space-filling' thickness. As Katz explained: 'A strong (and sufficiently rapid) stream of air or liquid [...] produces a space-filling film touch or immersed touch.'[67] Resonant with Baga's work is precisely the impression of an indeterminate substance of sorts—the curious 3D-enhanced amalgamation of natural elements such as rain or sleet, with light reflections and medial filters—that fills the space around the artists' hand as it intervenes in the image and immerses our bodies in the exhibition space. Indeed, the elastic medial milieu that Baga produces is strikingly evocative of the *diaphanes* that Somaini identified in Benjamin's artwork essay; diaphanes, as we recall, being the vaporous substances that make (visual) perception occur in the first place. In *Flatlands 3D*, however, the diaphanes summoned are not only enabling visual perception but are also evoked haptically through establishing the impression of film touch.

Moreover, perceived as an indeterminate substance rather than an enclosed and defined object, film touch appearances do not secure a stable orientation in space. In *Flatlands 3D*, spatial disorientation is further advanced by the fact that Baga's imagery frequently combines views from above and frontal views on top of each other, thwarting our proprioceptive direction.[68] Early on, a star-spangled floor carpet seen from above is superimposed onto a starry night sky seen from below. Later, as we gaze at a series of cloud formations in the sky, a foot steps onto it and resets our spatial position. Already noted is also the seemingly 'malleable and porous screen space' installed by Baga's employment of 3D, which undercuts the demarcation between screen space and exhibition space and marks the plane of the screen as profoundly pliable. A diverse set of effects work together here to undermine the sense of a stable orientation point in relation to the screen and its spatial depictions. The distinctive co-constitution of (hyper-) haptic space and (film) touch found in Baga's video installation thereby

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67   Katz paraphrased by Krueger. Ibid., p. 35.
68   As Anne Friedberg has noted, this mixing of a view from above with a frontal view within the same image is a staple of the windowed graphical user interface. Introduced together with this interface in the last half of 1970s was a 'mixed metaphor: a window and a desk', positioning the viewer simultaneously in front of and above what is seen. In Baga's installation, the same logic is at play but is now cut loose from the graphic renditions of framed windows and stacked documents, as well as the plane of the screen. Thereby this mixing of views becomes far more disorienting. Friedberg, *The Virtual Window*, p. 227. See also Miriam de Rosa and Wanda Strauven's essay 'Screenic (Re)orientations' in this volume for a discussion of the prevalence of this combination of desktop and window views in contemporary screen culture.

evokes Thomas Elsaesser's forceful argument that contemporary 3D cinema contributes to changing 'our sense of spatial and temporal orientation and our embodied relation to data-rich simulated environments'—albeit within a decidedly low-tech register.[69]

Concluding Remarks

Shared by Fu's *Belle Captive I* and Baga's *Flatlands 3D* and numerous other video works from the present decade are three interrelated features that together chart the contours of a haptic mode specific to the 21st century, whereby touch and space are imbricated in novel ways.

The first and most obvious feature is the intensification of the formal trope of the layering of various image planes, found in the scenography of early cinema as well as the windowed graphical user interface introduced in the 1980s. Inherent in this trope is a non-perspectival spatiality in which layers appear as separate with only frail or no connections—spatially or pictorially—between them. When resurfacing in 21st-century video art, however, this trope points to the seemingly paradoxical incongruity between the blunt flatness of the screen as an object that—through the prevalence of haptic interfaces—begs to be touched, and its function as a portal to the unfathomable depth of the infoscape that it opens onto. Secondly, found in much recent video art is the blurred, textured appearance that in Marks' understanding evokes haptic vision and lack of mastery and, by extension, human agency over the mediatic operations. When installed as immersive installations that fill the gallery space, blurring and texture moreover contribute to summoning an atmospheric and saturated space that in turn evokes an elemental understanding of contemporary media as our habitats and milieus. Thirdly, the sense of touch is ambivalently figured in these works as on the one hand active, manipulating, and tentatively controlling the entities it touches, and on the other as dispersed, precarious, and unable to guarantee spatial orientation. Addressed in these works is hence the impression of control and mastery over micro-tuned and planetary scaled computational processes that perceptually profoundly escape us. At the same time, they also highlight the felt impact of these processes on our bodies—their 'space-filling' and atmospheric presence, appearing most distinctly in Baga's work as 'film touch'.

If Lant's 'haptical cinema' registered the passage from the plane to the volumetric in the representational language of early cinema, a similar

69   Elsaesser, 'The "Return" of 3-D', p. 221.

claim can be made for the haptic prevalence evident in so much video art since around 2010. What these works address is the process whereby computational processes take flight from the flatness of the (computer) screen and into data-rich environments and atmospheres they open onto and produce, and ultimately how we may find our bearings within this lived environment. It is in this way that the works examined here can be seen as *tactic* in Benjamin's original sense: they chart a 'regrouping of apperception' that both explores and strikes back at the simultaneous dismantling and intensification of our sense(s) of touch as installed by 21st-century media.

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9. Screenic (Re)orientations: Desktop, Tabletop, Tablet, Booklet, Touchscreen, Etc.

Miriam De Rosa and Wanda Strauven

Abstract

This essay discusses the orientations of the screen both as work surface and as display surface by focusing on the shifts from and to the horizontal and vertical axes of the screenic space. To do so, we have collected a variety of examples, mainly media art installations but also films and mixed-media performances, which serve to reconstruct an 'evolution of the desk' and to retrieve a new gesturality. Balancing the producer's and the viewer's perspectives, we argue that it is no longer the function but the usage of a certain device that determines its position on either the vertical or the horizontal axis.

Keywords: Surface, table and wall *dispositifs*, performance, gesture, media art installation, desktop cinema

Introduction: From Desk to Desktop

In the autumn of 2015, an animated GIF entitled *Evolution of the Desk* circulated widely online.[1] As a sort of meta-memento, in a 357-image sequence lasting about 30 seconds, the animation synthesizes a three-and-a-half-decade timespan that turned our once-romantically chaotic desk into a hyper-rationalized and essential work surface, that is, the desktop area of the computer (and then laptop) screen. Structured around three famous (albeit

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1   Posted by Laura Sauser, *Evolution of the Desk* (GIF), 23 September 2014, http://blog.up.co/2014/09/23/evolution-desk-gif/. (Last accessed 4 April 2017).

mocked-up) Apple devices—the classic beige cube or Macintosh 128K, the dark grey PowerBook, and the silky thin MacBook Air—its timeline displays how, from 1980 to 2014, all kinds of office supplies and appliances—ranging from scissors and glue to the phone and fax machine—were gradually absorbed by the screen in the form of offline and online computer applications.[2] This resulted, according to the GIF, in clearing not only the top of our writing table but also the wall behind and the space underneath it. Such a transformation from the (physical) desk to the (metaphorical) desktop implies a number of reconfigurations concerning, among other things, the axial tension between horizontality and verticality—a tension that will be at the centre of this essay.

Let us have a closer look at the animated GIF. As its title indicates, it is all about the desk. The GIF illustrates how the centre/periphery balance of our way of working on a physical desk has drastically changed over the last decades through the convergence of several peripheral devices. Most of them will later become software applications to be activated from a unique machine, weaving and feeding a web of interconnected functionalities. The first device to be absorbed, in the mid-1980s, was the calculator. Then, during the 1990s, PowerPoint, Amazon.com, and Dictionary.com, along with Craigslist, Adobe PDF, and Blogger, made pieces of standard stationery, magazines, a voluminous dictionary, and the fax machine vanish. The second half of the following decade highlights a series of radically profound changes. Since 2006, looking for our next travel destination no longer implies a fast twirl of our old-fashioned globe but instead a click on Google Maps; our correspondence is replaced by Google Mail, which makes our cork bulletin board look rather pointless. Likewise, Facebook, Google Calendar, and Skype make obsolete our address book, paper wall-planner, and landline phone. At this point, a smartphone appears next to the laptop. This is followed by the emergence of YouTube, which allows us to watch clips on the same screen we are working on; Pandora, Yelp, LinkedIn, and Wikipedia continue the same convergence dynamics, until Google News, Ticketmaster, and a rich

2   Unfortunately, the animated GIF confuses the dates: it starts in 1980 with the image of the elementary cube-form desktop computer, which Steve Jobs introduced only in 1984. Instead, in 1984, the GIF already shows us the appearance of a black laptop, substituting the cube and its accessories (i.e. keyboard and mouse). Recalling Apple's PowerBook (launched in 1991) because of its dark colour and its blockish shape, the GIF laptop differs nevertheless in design, lacking the palm rest in front of the keyboard and the track ball in its centre. Then, in 2006, the thinner aluminum laptop appears, which seemingly mimics Apple's MacBook Air brought on the market two years later. However, in 2006, Apple introduced the MacBook Pro, which was the first Mac notebook to use an Intel processor and which might be the reference point for the GIF's last device.

series of social networks including Twitter, Instagram, and Pinterest get us to the point at which the desk is finally—ideally—almost empty.

This almost-empty desk emphasizes the shift to the online world, where we end up condensing our activities and tools.[3] As already mentioned, the clearing of the workstation also involves the space underneath it: our documents do not really need those non-practical drawers to be nicely archived because we now have Dropbox. Ironically enough, or for the sake of symbolic continuity, the functions of all the tools and objects that once lay on the top of the desk are now reunited on a metaphorical desktop, the so-called e-desk with its graphical user interface (GUI). One last step needs to be mentioned: once the apps have converged to this metaphorical desktop, the screenic surface of the laptop explodes, thereby expanding the practicable space to the surface of the screen we are actually using to watch the GIF.[4] What eventually remains on the desk next to the open laptop is the touchscreen-based smartphone, alongside a pair of sunglasses.

Horizontality vs. Verticality

Lying on the desk, the smartphone is a perfect example of a 'mobile screenic device', ready to take and to go, as easily as the sunglasses.[5] But what is more, when lying on the desk, the smartphone introduces a new positioning of the screen which is now no longer vertical but instead horizontal, that is, parallel to the work surface of the table. Yet, since it is a mobile screen, it can assume a whole range of different inclinations, from slightly tilted to upright.[6] In the hand of its user, the smartphone tends to remain in a

3   In this sense, the GIF seems to confirm what Félix Guattari foresaw regarding the evolution of screen media in terms of 'postmedia'. See Guattari, 'Towards a Post-Media Era', pp. 26-27.

4   This somehow creates a touchscreen illusion, as if the non-touchable laptop screen opened itself up and merged with the touchscreen surface of one of our more recent screenic devices, like the electronic tablet or the smartphone.

5   The term 'mobile screenic device' (MSD) was introduced by Heidi Rae Cooley. See Cooley, 'It's All About the Fit', pp. 133-155. While emphasizing the portability of sunglasses, it is worth pointing out that they may also allude to a particularly rich set of metaphorical interpretations. For instance, being simultaneously shades and filters, they reduce the natural light that might blind us, but at the same time, they somehow prevent us from watching in a transparent way, that is, they screen, allowing us to see things under a different light. Agnès Varda's short film *Les Fiancés du Pont Macdonald – ou Méfiez-vous des lunettes noires* (1961) nicely draws upon this double feature of the sunglasses.

6   This also applies to the electronic tablet, which can be held more or less horizontally like a book or put into a more upright position by means of various accessories, such as the original foldable iPad cover or all types of stands.

predominantly horizontal position for activities such as texting, browsing the Internet, checking posts on social networks, and even making phone calls when one has ear buds. This horizontally oriented, even if slightly tilted, screenic situation implies a 'looking down attitude', which characterizes today's smartphone addicts or so-called phubbers.[7] Regardless of its asocial implications, what interests us here is that this (new) downward-looking posture is in clear opposition to the traditional frontal viewing mode of the screen—be it a computer monitor, a film screen, a video installation wall, a painting, etc.

As exemplarily demonstrated by the GIF, the desktop computer abolishes the difference between horizontally and vertically placed objects, since they are all coming together on the same surface—resulting in the homogenization of the two axes. However, the difference between horizontality and verticality is re-established by various other media devices (such as the laptop, the smartphone, and the tablet) and, more specifically, by their screenic orientation. Therefore, it is no longer the function of a certain object (or application) to determine its position on either the vertical or the horizontal axis but rather its usage, which is linked to the orientation of the screen. For instance, the cork bulletin board, which used to hang vertically on the wall allowing the user to easily pin messages, postcards, and memoranda, finds its digital equivalent both in smartphone applications such as Reminders and Notes and in social bookmarking and photo-sharing platforms such as Pinterest, which can be accessed by different mobile screenic devices, positioned either vertically or horizontally. While simply checking and looking at a bulletin board website might (still) result in a frontal viewing position with the mobile screenic device held more or less vertically, during (participatory) actions such as writing posts or posting pictures, the screenic orientation tends to be more horizontal.

This structural evolution of the screen and the patterns of use derived from it are triggering, as we see it, a negotiation between horizontality and verticality that we propose to designate here as a 'reorientation'. With this term we refer to the axial repositioning of the screen: from horizontal to vertical or vice versa. But even when no such axial shifting is taking place, there might be a rearrangement of the screen: for instance, from the vertical wall where the bulletin board hangs to the vertically oriented desktop computer screen where we access a site like Pinterest.

In this essay, we are especially looking at examples where the screenic reorientation takes place in the passage from production (screen as work

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7   See Strauven, 'The Screenic Image', pp. 143-156.

surface) to reception (screen as display surface). Proposing a catalogue of case studies from predominantly contemporary filmmaking and visual arts, we intend to (re)consider the screenic space around its horizontal and vertical axes, taking into account both the artist's (or producer's) point of view and the position of the viewer (or user). In other words, the spatiality we are getting at involves not only the spatial orientation of the screen (and the screenic image) but also the situations of production and consumption that might take place along different spatial axes. Our exploration of the screenic space will not be limited to the literal screen but comprises more broadly an ensemble of surfaces serving as a screen in both its veiling and unveiling modes, that is, the screen as concealment or protection device and as display area.[8]

The aim of our essay is twofold. Focusing on the process of reorientation of the screen and its subsequent power of redesigning the space and modes of approaching it, we firstly want to suggest that such an axial reorientation implies a pragmatic shift based upon a reconfiguration of the patterns of use and of the space involved. Secondly, we want to point out that this variation in the usage of the screen implies a more profound change mirrored in our ways of conceptualizing the screenic device, therefore also implying an epistemological shift.[9] Thus, the various screenic reorientations will be studied in both practical and conceptual terms. This gives us the chance to propose possible revisions of the balance regulating the relationship between horizontality and verticality and to retrieve a new gesturality—or a new contextualization for an old gesturality (as, for instance, the browsing of a book). We wish, therefore, to couple our emphasis on the screenic (re)orientation to an engagement with the gesturality that it requires and inspires.

Gesturality has to be understood here as referring to both the performative acts and the situatedness of the human body.[10] This applies not only to the author or creator of the artwork but also to the viewer as active subject.

8   On this double dimension of the screen, see Avezzù, 'Intersections Between Showing and Concealment', pp. 29-41. More generally, on the archaeology of the screen, see, among others, Huhtamo, 'Elements of Screenology', pp. 31-82. Our reading of screens as surfaces is in line with the perspective proposed in Bruno, *Surface*. While Bruno proposes to rethink screens and other kinds of surfaces in material terms, our focus is centred on pragmatics and observes the axial tensions that are at stake in specific screenic dispositifs.

9   The second point has been further developed by Miriam De Rosa in her Arthemis lecture at Concordia University in Montréal in April 2016. See De Rosa, 'Desktop Cinema'.

10   Our concept of gesturality is primarily inspired by that of gesture. On the latter, see at least Agamben, 'Notes on Gesture'; and Flusser, *Gestures*.

In our discussion of interactive art installations, the term 'gesturality' might seem to refer primarily to hand gestures. Yet it implies the full body, as the hand belongs to a whole that is physically embedded in space and that, in the case of the viewer's body, needs to move forward or around in order to experience the artwork. The term, then, does not simply refer to the actual touch of a screenic surface but is rather about the position and movement of the full body in and through space. Thus, for a better understanding of the different viewing perspectives, we need to look at the body of the viewer as it is situated in the same environment where the screenic image unfolds.

It is precisely such an environment that constitutes what we propose to call the 'screenic dispositif'. With the term 'dispositif', we mean the setting or spatial organization as well as the aspects pertaining to the spectator, such as his or her position in relation to the image. We also adopt the concept of disposition, which is instead used to convey the importance of the environmental dimension and which is crucial for our study of the screenic dispositif, because it is indeed in space that an orientation of the screenic image and its variations (or reorientations) take place.[11] In this view, the notion of dispositif includes not only the spectator as physical presence but also his or her surroundings. The viewer, museum-goer, or user is considered within the spatial (and more specifically axial) arrangement as a moving element, as a body in motion, erect and therefore vertical but also moving along the horizontal viewing line. It is important to point out that the starting point of our analysis is not the cinematographic dispositif (i.e. the classical dispositif of the movie theatre) but instead the exhibition dispositif of the modern museum, where paintings—and later on video and film installations—are traditionally exhibited along the vertical axis.[12] The traditionally vertical orientation of the screen as exhibition surface certainly allows for a connection with the cinema screen, as also illustrated by some of our case studies that involve a mixture of the two dispositifs.

Axial Categories

Looking at contemporary video artworks and media installations as dispositifs that are explicitly playing with the tension between horizontality

11   For a specific account of the notion of disposition, see De Rosa, 'Disposition & Duality', pp. 385-391.
12   On gallery films, see among others Butler, 'A Deictic Turn', pp. 305-323; and Fowler, 'Room for Experiment', pp. 324-344.

and verticality, we have identified five categories that consist of five different screenic reorientations which are taking place, as already mentioned above, in the passage from production to reception. We consider the screen in its double entity of work surface (WS) and display surface (DS), as it is conceived or produced by the artist (or maker), as well as the way it is viewed or consumed by the spectator (or user). Our five categories are: 1) horizontal WS and horizontal DS; 2) horizontal WS and vertical DS; 3) vertical WS and vertical DS; 4) vertical WS and horizontal DS; and 5) horizontal/vertical WS and vertical/horizontal DS. This axial classification is deliberately limited to perpendicular angulations, making abstraction of all the many screenic inclinations that exist between the perfectly horizontal line, which constitutes a 'table dispositif', and the perfectly vertical line, which constitutes a 'wall dispositif'. A 'table dispositif' is a horizontally oriented screen, placed like the top of a physical desk or table, whereas a 'wall dispositif' entails a vertically oriented screen, similar to the canvas on an easel or the screen of the desktop computer.

The axial orientation of the screen needs to be distinguished from its mode of framing, which can also be thought of in terms of verticality (i.e. the so-called portrait mode) and horizontality (i.e. the so-called land-scape mode). Both landscape and portrait paintings will be considered here as vertically oriented screens when they are exhibited on the wall. When, instead, they are placed on a table (or a floor, for that matter), they become 'table dispositifs'. In other words, we are not engaging here with the phenomenon of vertical framing (or vertical cinema). Nevertheless, the framing of the image (or the representation within the framing) may sometimes cause, as we will point out, a tension with the axial position of the screen, which complicates (but also enriches) our categorization. On the other hand, we are not so much interested here in the image as representation but rather in the image as screenic appearance, that is, as a depiction that is made available on a screen (even if sometimes there is no physical screen but only a wall or a floor), as implied by our notion of the 'screenic dispositif'.

Our catalogue is not meant to be exhaustive; on the contrary, it is an explorative way of grouping our case studies, of bringing together emblematic works that offer similar axial tensions and that we find particularly sympto-matic of the practical and conceptual reconfiguration of the screen. While many contemporary artists are clearly inspired by (or explicitly playing with) the possibilities of screenic reorientation offered by new technologies, we do not believe it is an exclusively present-day phenomenon. Rather, we see the

five categories as five genealogies, each with their historical manifestations and multiple origins.[13]

Lastly, each of the categories is linked to a specific gesture activated by its central object (or practice): the act of tapping on a table, the act of flipping through a book, the act of moving the cursor on the computer's desktop, the act of treading on a carpet, and the complex/mixed gesturality of (live) performance. Our overview discusses these different modes of gesturality in a sort of crescendo, from small gestures to a full body engagement.

1. Horizontal-Horizontal: Table Installations

As narrated by our opening GIF, the 'evolution of the desk' from 1980 to today resided in the transformation of the physical desk into the metaphorical desktop, which resulted in the convergence of all kinds of objects on the vertically oriented computer/laptop screen. The exact opposite logic is at stake in our first case study: the DigitalDesk—a device developed in the early 1990s by Pierre Wellner at Xerox EuroPARC, the European branch of the Xerox PARC research centre. In Wellner's own words:

> The DigitalDesk is an ordinary desk and can be used as such, but it has a few extra capabilities. A video camera is mounted above the desk pointing down at the work surface. This camera's output is fed through a system that can detect where the user is pointing, and it can read portions of documents that are placed on the desk. A computer-driven projector is also mounted above the desk, allowing the system to superimpose electronic objects onto paper documents and the user's work surface.[14]

Thus, the DigitalDesk is a table dispositif that consists of the projection of a user interface onto the physical desk from above. Both the camera eye and the user's gaze are directed downward toward the horizontal surface, the table functioning as a screen on which everything converges. Not only do physical and electronic objects come together, the human finger is also

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13   Far from searching for the 'pure origin', we propose a Foucauldian/Nietzschean genealogy of a number of screenic configurations conceived in their variable multiplicity, as screen media are understood here as complex, adaptable, and dynamic forms.

14   Wellner, 'The DigitalDesk Calculator', p. 28. See http://uist.acm.org/archive/html/proceedings/1991.html. See also the demo video made in 1991: Wellner, 'Tactile Manipulation on a Digital Desk', *YouTube* (16 December 2009), https://www.youtube.com/watch?v=laApNiNpnvI. (Accessed 4 April 2017).
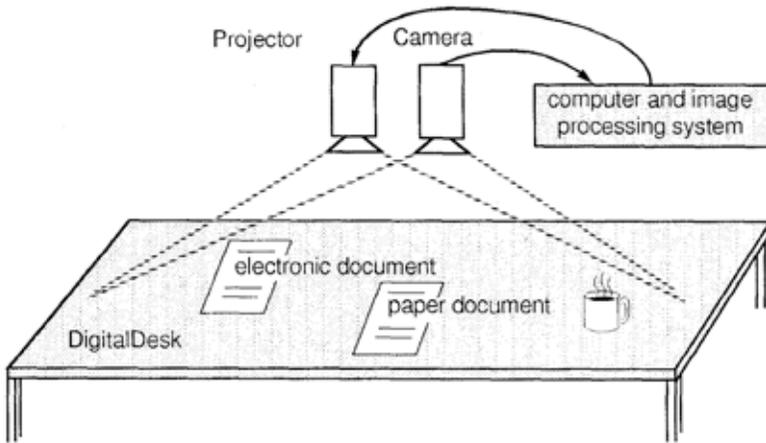
18. A DigitalDesk scheme by Pierre Wellner. From The DigitalDesk Calculator: Tangible Manipulation on a Desk Top Display. November 11-13, 1991. Courtesy of the Association of Computing Machinery.

conflated with the cursor—or rather, the finger becomes the computer mouse, which moves across the 'touchscreen' and acts directly (e.g. pushing the projected buttons of the calculator). By getting rid of the (vertically oriented) computer screen, the idea was to reduce the degree of mediation. Yet the logic of this 'touchscreen' dispositif is mediated per se: you touch a 'real' surface (table) that is meant to take your action onto a different level/surface (GUI). The latter is conceived precisely to introduce a non-physical dimension where the physical performance is then translated. It is important to stress here that the DigitalDesk was supposed to replace the desktop metaphor, which Xerox PARC themselves introduced in 1970. In other words, it was a very explicit attempt to (re)create the working area of the computer screen upon the top of the physical desk, that is, to turn back from the (metaphorical) desktop to the (literal) desk.

Although we consider the DigitalDesk as the matrix of our first category, it clearly is not an artwork. But like the two art installations that follow, its dispositif is characterized by a double horizontality, given the horizontal orientation of both the WS and the DS. An art installation that is arranged as a table dispositif can be called a table installation. Typically, such an installation invites quite naturally museum-goers to come close and put their hands on its (horizontal) surface. An exemplary case, contemporaneous with the DigitalDesk, is Janet Cardiff's *To Touch* (1993). This installation explicitly asked visitors to touch an old carpenter's table, placed in a darkened exhibition room and surrounded by sixteen audio speakers

affixed on the walls.[15] The seemingly simple wooden worktable is, in fact, an interactive 'touchscreen', that is, a 'screen that *must* be touched' in order to bring the artwork to life in its proper dimension as sound installation.[16] It contains hidden photocells that are activated by the touch of the visitor's hand running over the rough surface and that, in turn, trigger specific sound bites—ranging from human voices, whispers, and dialogues to music and environmental sounds. The gesture of the visitor's hands is horizontal, as is the screenic orientation. Although no screenic reorientation is taking place, the tension between horizontality and verticality is nevertheless deepened, as the visitor who is looking down at the work tends to look up and around to understand where the sound feedback is coming from. In other words, there is a reorientation of the viewer's gaze that consists of a shift from the vertical viewing mode (looking down towards one's own hands) to a horizontal viewing mode (looking around the room).

A similar reorientation of the viewer's gaze might happen in *Tavoli* (*Perchè queste mani mi toccano?*) [Tables (Why are these hands touching me?)] (1995), an interactive video environment conceived by the Milan-based art collective Studio Azzurro. Consisting of six 'sensible' tables randomly arranged in a darkened gallery room, *Tavoli* also comes with sound effects, such as the dripping of water. Here the visitor touching the tables, one by one, might look upwards not so much to understand where the sound is coming from but rather to figure out the (simulated) touchscreen principle of the installation. Each of the tables displays a still image that is projected from above and put into motion by means of a simple touch (or tap) by the hand on the table. One might say that, more than in Cardiff's installation, *Tavoli* is about the tabletop, that is, the flat surface of the table. The horizontality of the installation is reinforced by the fact that the images projected onto the tabletops are all images of objects or bodies lying down and being filmed from above (e.g. a bowl placed on a tablecloth that is torn away when put in motion, the rippling of water, a woman on all fours, another one crawling on her back, etc.). What is important to mention, lastly, is that the subtitle of the artwork ('Why are these hands touching me?') evokes a certain sense of gesturality from the table's perspective and not from that of the viewer.

In *To Touch* and *Tavoli*, the viewer is a user, a spectator whose active participation is required to animate the artwork, to make it operative. Also notable is that these table installations, like the DigitalDesk, are touch-based

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15   See http://cardiffmiller.com/artworks/inst/totouch.html. (Accessed 4 April 2017).

16   Verhoeff, *Mobile Screens*, p. 24.

without, however, involving any touchscreen technology. Their tabletops are non-technological touchscreens, or non-screens, engaging the viewer/user in a gesturality of physical contact onto their horizontally oriented plane.

2.   Horizontal-Vertical: Book Browsing

Our hypothesis—that table installations, because of their horizontal arrangement, most easily favour a tactile interaction or manipulation—is confirmed by opposition by the second axial category, which consists of case studies that are reorienting the producer's (or maker's) horizontal screenic surface (WS) 90 degrees to a vertically mounted non-interactive screen (DS). The result of such a screenic reorientation is a wall dispositif that is not 'accessible' for the viewer. Thomas Hirschhorn's *Touching Reality* (2012) is a case in point. The installation consists of a video projected onto a vertically oriented screen. The video shows us an index finger of a female hand scrolling through a series of images on a touchscreen device, most probably an iPad. In fact, we do not see what is around this touchscreen gesture (or 'Apple gesture'), as there is a perfect conflation between the projection screen and the touchscreen device's screen.[17] We do not see the frame around the iPad's screen, nor the table on which it is placed.

Most probably, during the shooting process of *Touching Reality*, the tablet was lying on a horizontal surface with the *performing* hand being recorded from above. As we would like to emphasize, the Apple gestures—besides the forefinger swiping from left to right and back again, the video also displays the pinching between index finger and thumb in order to zoom in and out—are *performed* in a very controlled way. Even if it is not Hirschhorn's, the hand clearly belongs to someone who is consciously taking part in the choreography. The hand is acting in a quite theatrical fashion. But what is more, the installation offers the spectator a non-interactive choreography of interactivity: it is a recording of a staged spectacle of interactivity.

The staged, mechanical movement of the performing hand makes the artwork even more shocking, since the scrolled-through images are all brutal images of mutilated, blood-covered bodies. Yet the finger does not seem to be affected by the horror on display; on the contrary, it browses the tablet as if it were any kind of picture book. It is a non-engaged gesture which, in the artist's own words, 'seems to be a gesture of sensitivity but at the same time

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17   Hirschhorn, 'Insoutenables destructions du corps', http://www.dailymotion.com/video/xshfl0_thomas-hirschhorn- insoutenables-destructions-du-corps_creation. (Accessed 4 April 2017).

is a gesture of enormous distancing'.[18] Such a distancing is reinforced by the choice to exclude the spectator from engaging directly with the artwork, which is projected, enlarged and reoriented, onto the vertical surface of the gallery's wall. Thus, the closeness of the touchscreen interaction of the work's production mode is annulled, alongside its horizontality. Nevertheless, thanks to the landscape display mode of the tablet, the horizontality of the work is still present as mode (or framing) of representation.

As an antecedent to Hirschhorn's representation of tablet browsing (on an invisible, un-represented table), we would like to include the short black-and-white video *Essence* (1975) by the Italian filmmaking couple Yervant Gianikian and Angela Ricci Lucchi. In this video, we see a hand leafing through a small book that, because of its size and its rectangular shape, recalls the flipbook. But instead of the quick manipulation required for the latter, Gianikian and Ricci Lucchi's actor performs the action of turning the pages very slowly, one by one, allowing the viewer to read the text, which is taken from Étienne Bonnot de Condillac's *Traité des sensations* [Treatise on Sensations] (1754). As in the case of *Touching Reality*, there is a high degree of stagedness, of controlled action.[19] Yet, unlike *Touching Reality*, its framing is not restricted to the screen's surface (or the page's type-area), as we clearly see that the little book is lying on a surface, most likely a table. The action is filmed from above, from an extreme high-angle shot. Like in Hirschhorn's installation, however, when displayed as a projection, the film implies a screenic reorientation from the horizontal table on which the performer acts to the traditional, vertically positioned screen, monitor or projection wall (i.e. a wall dispositif). This 90-degree reorientation transforms the table from a physical plane on which objects can be placed to a surface for visual display, which is similar to the shift from the desk to the desktop in our opening GIF.

Of course, film history is rich with cases illustrating the downwards-looking viewing mode (and its screenic reorientation during projection), ranging from aerial footage to vertiginous winding staircases, from the Busby Berkeley top shots in classical musicals to didascalic instances of writing letters or notes. We want to retain one example that we find particularly emblematic and relevant for our argument, namely, the famous picture postcard sequence in *Les Carabiniers* [The Riflemen] (1963) by Jean-Luc Godard. When the protagonists—two bumpkins who joined the King's

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18   Ibid.; our translation.
19   See also Parolo, who describes the video as a 'reflection on cinematographic animation, iconic-graphic writing and performativity'. See Parolo, 'Essence', p. 98; our translation.

Army to get rich—triumphantly return home with their war conquests, a table functions both as physical support and as display surface. First, with a rough gesture, the riflemen place the suitcase on the table. When the suitcase is opened in front of their wives, the spectator too gets a glimpse of the countless postcards, which are bundled in packages, grouped according to the principle of 'order and method'.[20] Then, the riflemen display each category, and its subcategories, by naming the constituting objects and throwing the respective postcards, one by one, on the table—a ritual that cross-cuts between frontal views of the actors and high-angle views of the table. Unlike in *Essence*, it is not an extreme high-angle shot, but the effect is quite similar. The cards are thrown on top of one another, resulting in stacks on the table.[21] An exception is made for the last category, which consists of Women ('Women are a different thing, that's another category!').[22] Here the cards are placed, a bit more gently than in the previous categories, according to three horizontal lines on top of the closed suitcase, lying on the table. The cards partially overlap, like the multiple windows on the desktop of a computer screen. The hand placing the cards is prominently present, somehow echoing—in an anachronistic way—the index finger gliding over the dead bodies in *Touching Reality*. The images, however, are of a totally different nature, more akin to those of glamor if not pornographic magazines—shown to us in a form of intra-frame collage (as opposed to inter-frame montage).

A connection could be made with the Cubist collage technique, which not only brings together various axial perspectives into its picture plane but also induces the artist to work on a horizontal surface in order to facilitate the gluing of newspapers clippings onto the drawing paper.[23] To complete our second axial category, we would like to briefly mention another example from the field of the visual arts which, like the Cubist collage, is a new (or avant-garde) painterly technique: drip painting. Invented in the first half of the twentieth century by Surrealist artists such as Francis Picabia and Max

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20   Jean-Luc Godard, *Les Carabiniers* (1963); our translation.

21   Interestingly enough, Facebook took up the same motif (and gesture) of throwing pictures on our virtual walls, selected from our own personal archives and edited into a short video to be posted, as a way of celebrating Happy Friends Day on 4 February 2016.

22   Jean-Luc Godard, *Les Carabiniers* (1963); our translation.

23   See also Henri Matisse's technique of cut-outs (or *gouaches découpées*), invented to cope with his impaired health situation in the 1940s. The technique consisted of cutting sheets of paper, pre-painted with gouache by his assistants, into various shapes that would fall on the table or onto the floor, and then be rearranged and glued into colourful compositions to be exhibited vertically. MoMA devoted an exhibition to this technique of Matisse; for more details, see Friedman et al. (eds.), *Henri Matisse.*

Ernst, this technique became the signature style of Jackson Pollock who, in the 1940s, started laying his canvases out on the studio floor, pouring and dripping liquid paint over them. The reorientation from horizontality (canvas on the floor) to verticality (painting on the wall) is at the core of Pollock's unique style. The physical traces of the action of pouring and dripping gives his work a highly performative quality, which is properly reflected by the term 'action painting'.[24]

3. Vertical-Horizontal: Carpets and Floor Screens

Keeping in mind Jackson Pollock's 'action painting' technique, our third axial category consists of the exact opposite technique, that is, the wall (or easel) as production mode (or WS) and the floor as viewing mode (or DS). A blueprint of this screenic reorientation can be found in the textile tradition, more specifically in the genealogy of carpet weaving. We are thinking here of carpets woven on vertical looms, to be put on the floor as decoration and/or insulation.[25] Surfaces that act as a 'floor screen' because of their horizontal arrangement constitute a special case of table dispositif, which might be better termed 'floor dispositif'. This type of dispositif invites a response that differs from the installations discussed in our first category. For instance, a video loop that is projected onto the floor as a carpet might invite museum-goers, especially the youngest among them, to walk and even jump on it. The Royal Belgian Institute of Natural Science in Brussels hosts such an installation, which consists of a non-interactive animation video combining both horizontal and vertical perspectives: a green field with flowers, walking ducks, and flying birds. Despite its non-interactive nature, children find ways to engage with the installation, trampling the flowers or trying to make the ducks fly. The loop was probably made on the vertically oriented screen of a computer and therefore reoriented when

24   According to Rosalind Krauss, Pollock put his canvases on the floor not only to gain more space and freedom of action while painting but also to re-contextualize the art form he was up to, and from there to articulate some vectors, which the American art critic defines as the 'horizontal field of an event', thereby emphasizing the performative dimension of the creative act. The surface reorientation here is quite self-explanatory, yet we find it particularly interesting to underscore how the pragmatic shift from a wall dispositif to a table dispositif is, once again, determined by practice, that is, from Pollock's own gesturality. Such a positional change leads to a conceptual revision—the disposition redesigning the dispositif. See Krauss, *A Voyage on the North Sea*.

25   The same functions also apply to tapestry, which is, however, commonly destined for a vertical orientation (draped on the wall). See for instance Bloch, 'Frontality', pp. S44-S59; and Goren, 'Pilgrimage, Tapestries, and Cartography', pp. 489-513.

projected onto the floor screen. Differently from the live action recording of Hirschhorn's *Touching Reality* or Gianikian and Ricci Lucchi's *Essence*, the producer's creative act coincides here with the (post)production process of the computer animation. Nevertheless, the screenic reorientation from computer screen to floor screen also involves a reorientation of the animated images; for instance, the 2D profiled ducks are no longer seen from the side (as conceived on the vertically oriented computer screen) but from above, now resembling paper cut-outs dropped on the floor.

A similar principle is at work in the video installation *Spill Life* (2014-2015), conceived in two installments by LOOP.[26] The interactive mechanism is water-based: visitors are explicitly invited to collect water with a glass and then spill it into a beaker placed in the centre of the room. The more water the participants pour, the more the plants of the 3D animation grow. The title of the installation is an obvious pun on 'still life', which in Italian is called *natura morta* (dead nature). *Spill Life* is about the tension between nature and technology, between the (digitally) animated *natura morta* and the low-tech gesture of the human hand. However, no 'real' interaction between the two is taking place since the operating hand cannot touch the source of the animated action nor change its course.[27] It all happens through the experimental interface, which communicates with a computer when the right amount (or rather weight) of water has been poured into the beaker.

In axial terms, the first installment of *Spill Life* reoriented the gaze: various clips of computer imagery were projected high up onto the (vertical) walls of an old building, forcing the amazed spectators to look up. Yet in the second installment, *SPILL LIFE #2 – Versus Natura* (2015), the artists projected their vertically created computer animation onto the floor of the inner court of Palazzo Bevilacqua. This old palazzo has a well at its centre, around which the water-spilling action was organized. Like the floor screen of the Royal Belgian Institute of Natural Science, this stone carpet became a screenic playground for children who tried to catch the butterflies flying above the colourful flowers that had grown thanks to the spilling of water. Again, the animation video itself was not interactive.

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26   The first installment took place at the Water Design event in Bologna in October 2014; the second one featured at the White Night of Bologna ArtCity in January 2015. Promotional clips of both installments can be found, respectively, at https://www.youtube.com/watch?v=fBXKUHqslQo and https://www.youtube.com/watch?v=KydJK_CEhuM. (Accessed 4 April 2017). See also http://www.bolognatoday.it/eventi/mostre/as-above-so-below-loop.html. (Accessed 4 April 2017).

27   On the relationship between the intangible digital materiality of the operations of the touchscreen and the shortcomings of the capacity of touch in the face of it, see Sæther, 'Gestures of Touch in Recent Video Art', pp. 89-110.

Floor screens are also popular outside the museum world, for instance, in discos or nightclubs. As shown by the above examples, the gesturality in this category of screenic reorientations is no longer in the hands of the hands but instead of the feet—jumping, stomping, dancing, trampling. This is a major difference with artworks that are reoriented 90 degrees in the other direction towards the ceiling. Generally, such a screenic reorientation from vertical WS (i.e. the computer screen) to horizontal DS (i.e. the ceiling) does not allow any form of physical contact, simply because the screen is quite literally out of reach.[28]

Between floor and ceiling, a special case is offered by Bill Viola's video sculpture, *Heaven and Earth* (1992). This installation consists of an encounter between two CTR monitors that are stripped and unboxed. Both screens are placed in a horizontal position, the one with the close-up of a newborn facing up and the other with the image of an old woman facing down. In fact, the screens are facing one another, mounted at the ends of two wooden columns that are each extending from the floor and the ceiling, respectively—a screenic dispositif that creates the effect of a single wooden column with a gap in its centre. In order to see the black-and-white images emitted by and reflected upon both screens as they almost touch one another, visitors need to get very close and literally put their nose in between. It is an installation of proximity that is not supposed to be touched but that cannot be contemplated in a traditional way, either.

The crucial intimacy of *Heaven and Earth*'s exhibition space is in contrast with most of Viola's video works which often require huge rooms and projection walls, as is the case in his 'chapel' installation, *Going Forth By Day* (2002), conceived as an HD video tribute to Giotto's Scrovegni Chapel frescoes. Of the five panels that constitute this major video installation, *The Path* directly connects to our next axial category, even if it creates a strong feeling of horizontality. Projected on the wall, we see people walking through a forest in a long, panoramic moving image. And as visitors, we walk along their path, following their flow in a never-ending journey.

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28   Being out of reach does not necessarily exclude interaction or manipulation/operation from the side of the viewer. This is the logic behind the newly designed Moonlite device that uses the flashlight of your smartphone to project images on the ceiling of your (or your child's) bedroom. The device uses disk-formed reels, similar to those of the View-Master, and is connected to a bedtime story app. See https://www.kickstarter.com/projects/1483155071/moonlite-a-bedtime-story-projector-for-your-mobile. (Accessed 4 April 2017).

4. Vertical-Vertical: Desktop Cinema

Entering the exhibition space of the Italian Pavilion at the Expo 2010 in Shanghai, the visitor is confronted with a room that is limited diagonally by a massive translucent screen. The images projected on the screen represent the clear focus of the whole space. However, it takes some time to understand how to relate to the images: they show a number of life-sized people walking along the wall of sorts that the device ends up building, and the spectators cannot help but following them, either with their eyes or with their full bodies. In this wall dispositif, the visitors are quite free to move—a fact that makes them empathize with these figures. The sense of proximity is even more emphasized as they literally get in touch with the projected life-sized people, since the full interactive dimension of the installation is disclosed by touching the screen. The visitors realize that what is vertically located right in front of them is not simply a screen but a multilayered ensemble of superimposed screens, the closest of which is touch-based. In fact, the key gesture to let the artwork unfold further meanings and visual layers is not the frontal viewing mode of distanced contemplation but instead the direct contact between the visitor's hand and the walking figures. Resembling the act of stopping passers-by to ask for directions, the visitor's touch arrests the walkers' movement. The walkers turn towards the visitor and start telling their story. In the background, their words find completion in the maps, the photographs, and the video sequences that describe the journey they are talking about. The result is a 'sensitive' portrait of minor Italian cities, as the title of the installation, *Sensitive City*, also reveals.[29] Created by Studio Azzurro, this video environment is a vertically displayed artwork, conceived to be consumed by spectators in a standing position, but it strongly alludes to the horizontal axis, as they are called to walk along with the projected people, precisely like in Viola's above-mentioned video panel *The Path*.

In more analytical terms, from a producer's point of view, the characters were filmed with a camera shooting frontally, and the same frontal position is occupied by the projector once the artwork is installed. The spectators are asked to activate a frontal kind of looking and to touch the vertical screens. Standing vertically, upright in front of the screens, they reduce their mobility throughout the exhibition space and thus find themselves in a revisited organization of what, ultimately, is a model of consumption of the moving image that is quite close to the traditional exhibition dispositif.

29   For a thorough analysis of the installation, see De Rosa, *Cinema e postmedia,* in particular Chapter 5.

Despite the strong element of interaction, then, the contemplative stance characterizing the spectator's attitude seems here to be the main feature determining a pragmatic re-disposition of the situation: in comparison to the table installations where we do not need the dispositif to be vertical in order to operate it, *Sensitive City* offers a screenic articulation rooted first and foremost in the request to be looked at and through. It is then this very function—better yet the usage—that decides the whole orientation. Conceptually echoing the staged dimension we already mentioned in the category of book browsing, looking wins over touching even if without the latter, the artwork is not fully activated.[30]

We see this installation as a matrix of our fourth axial category, which includes works that explore the combination of double verticality. As in *Sensitive City,* the films and installations belonging to this group propose a rather classical arrangement of the screenic axis and of the author/spectator's postures. Instead of creating a real tension between the two coordinates, they nevertheless evoke some friction and explicitly call for a closer reading of the innovative character of their fabrication.

All produced between 2013 and 2015, the works we wish to mention here have been presented in very diverse occasions and venues ranging from galleries to film festivals and Internet platforms. They are all (except one) fully digital works that share a specific sensitivity towards the issue of the screenic image. Thematizing or presenting a structural reference to the balance between horizontal and vertical axes, these works create an interesting conceptual superimposition between representation and setting, which is to be found especially in the deictic aspect, that is, at the intersection of production and spectatorship.

Introducing these works along a line that sees the presence of the screenic image from the highest (and exclusively) aesthetic to a dispositif-related dimension, our first encounter is with Victoria Fu's *Lorem ipsum 1* (2013), a 16mm film transferred to digital. Following a woman's movements

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30   By way of touching, spectators activate a new visual expansion of the image, for their gestures also elicit a sort of lateral development of the visuals on the surface of the screen in the foreground as well as the articulation of a new depth created by the unfolding of other audiovisual materials in the other screens placed behind the former. The sound dimension is probably the element that mostly underscores the difference between the situation before and after the touch gesture takes place, tracing a continuity based on the cause/effect connection between the touch and the sound feedback that bridges this installation and Cardiff's table installation (see category 1). Given the similarity of the logics behind the two artworks, it is interesting to notice that the orientation and therefore the usage of the screenic device is what differentiate them.

throughout a domestic environment, the installation introduces a series of visual tropes—such as the multiplicity of frames—that anticipate a PC-interface-based aesthetics, which constitutes the core of our fourth category. Remaining on the representational level, the reiterated image of opening and closing doors, windows, etc. works here as *fictionalized mobilization* of the screen. A threshold on the whole, this artwork simulates in a quite visionary fashion the possibilities for the manipulation and integration of the interface window into the cinematic language: when watching this work on a big projection screen in the gallery space, it seems indeed as if we are looking at a huge desktop computer screen. This is why we see *Lorem Ipsum 1* as an important antecedent of desktop cinema.

First used by Miriam De Rosa to describe Kevin B. Lee's video-essay *Transformers: The Premake* (2014), the label 'desktop cinema' refers to those films that incorporate the desktop environment in the narrative by way of a combination of pre-recorded desktop footage and other sources, including original or found footage, as well as PC-delivered data. In particular, Lee emphasizes the idea of documentation, as to indicate the process connecting all these kinds of audio-visual materials; it is not by chance that he refers to his own pioneering production style as 'desktop documentary'.[31] Clearly, adding this category to our journey into the (re)orientation of the screen signals an important step that, if somewhat anticipated by our opening GIF, becomes here quite emblematic: the centrality of the (desktop/laptop) computer screen—a WS that becomes a DS, too. By Lee's own admission, the inclusion of such an element and the way it is conceived in the frame of desktop cinema, was not something he pre-established:

> I realized that a lot [...] of this investigation had taken place on my computer through finding all those videos, editing the footage on my computer, doing all the research on my computer, so why not have the computer be the stage or the set for the story to take place? Not just as the machine by which you put the movie together, but the set where the movie takes place. So you can start thinking the desktop in multiple definitions *of what it's doing*: it can be the apparatus through which you make the film, but it can be the setting, and then when it becomes the setting you think—is it a location? Is it a place? Or is it actually a camera that is capturing images one after another? How does this desktop environment

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31   Lee, 'De-Coding or Re-Encoding', p. 220. For 'desktop cinema', see De Rosa's Arthemis lecture with the same name.

work cinematically? Is it a screen? Is it a camera? Is it an editing device?
[...] There are all these existing techniques, and methods and *concepts
by which we understand cinema*.[32]

Confirming the tight connection between new usages ('what [the desktop]
is doing') and new ways of thinking about the screen ('concepts by which
we understand cinema'), what desktop cinema reveals, then, is not a new
relationship between horizontality and verticality but rather an exacerba-
tion of the features of the 'dynamic screen', as defined by Lev Manovich.
The desktop metaphor reigning today on our computer screens shows a
basic continuity with the classic conception that sees the screen as a 'flat,
rectangular surface [intended] for frontal viewing', actually existing in
the same phenomenological dimension where the body of the viewer also
exists.[33] Working as a portal towards an interactive elsewhere, at the same
time it introduces a new depth able to trigger what Alexander Galloway
has called an 'interface effect [bringing] about transformations in material
states'.[34]

   Developed in terms that echo Marx and Engels' Communist Manifesto,
the same 'interface effect' constitutes the heart of Louis Henderson's desktop
film *All That Is Solid* (2014). Focused on the parallel between an e-waste
dump site and a neo-colonial illegal gold mine in Ghana, the video proposes
a multiplication of windows on the desktop, disposing them in a *mise-
en-abyme* set that conveys a clear critique of the capitalist system and its
production processes, underscoring the contrast between the predicated
intangibility of computer technology and the sense of weight characterizing
the mineral extraction. The same technique is also used by Camille Henrot
in her award-winning video *Grosse Fatigue* (2013). Centred on the narrative
about the creation of the universe, the artist uses the desktop environment
as a displayed working surface where manifold windows simultaneously
show us fragments of the myth of the origin.

   In comparison to Lee's work, *All That Is Solid* and *Grosse Fatigue*, while
definitely sharing the same desktop aesthetics, propose a higher degree of
stagedness. Even though we clearly see the interface (frames of the windows,

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32   'Kevin B. Lee discusses Desktop Documentary and Transformers: The Premake', lecture
podcast available online at *Film Studies For Free*, 6 April 2015: http://filmstudiesforfree.podbean.
com/e/kevin-b-lee-discusses-desktop-documentary-and-transformers-the-premake/. (Ac-
cessed 4 April 2017); our emphasis. The film is also available at https://www.youtube.com/
watch?v=dD3K1eWXI54. (Accessed 4 April 2017).
33   Manovich, 'Towards an Archaeology of the Computer Screen', p. 28.
34   Galloway, *The Interface Effect*, p. vii.

option bar at the top of the screen, desktop in the background, icons on top of it), no cursor shows us the presence of an agency operating on the desktop. Whereas *The Premake* unveils the intention of the author in the very moment in which it takes shape, Henderson and Henrot do not disclose their gestures. In their videos, the actions mobilizing the windows—which can be seen as represented screens on-screen—are most evidently following a script.

We are not claiming by any means that such difference symptomatizes either the non-performativity of Lee's exercise (which is also clearly prepared and rehearsed in view of the screen recording), nor Henderson and Henrot's non-adherence to a real time-inspired language; the point we rather wish to make is to highlight a continuity with the staged aspect we already observed in our second category of book browsing. Possibly in a more striking way than in Hirschhorn, the presence of the interface alludes here to the chance of an interaction with the spectator who would join the author in the displayed universe of performativity but who cannot effectively operate on the desktop. In other words, these works offer choreographies of interactivity without being really interactive for the spectator. As in Hirshhorn's case, we are presented a recorded spectacle of interactivity and, therefore, a simulated spectacle of interactivity, where the recorded yet supposedly interactive gestures are in fact 'fake'. What we see unfolding is the calculated result of a gesturality, which is purposely designed by the authors in order to imitate the interface (which, interestingly enough, is in turn designed to imitate or allude to an exquisitely human gesturality). What is at stake is an aesthetics of fakeness, which most of the time sits on a strong presence of the author and a consistent hypermediacy of the screenic interface.[35]

The same sense of fabrication is made more explicit in a series of contemporary works all featuring a direct and ironic reference to gesturality and, in particular, to the Apple gesture. In the single-channel video installation *Belle Captive 1* (2013) by Victoria Fu, for example, we have two vertically oriented screens in front of a wall; they are placed like overlapping windows on a computer screen and a projection goes over both screens flowing over their edges, creating a halo that expands onto the floor and that produces the illusory impression of some horizontality.[36] However, the main illusory aspect pertains the touchscreen effect, as we see a touchscreen gesture

35   On the notion of hypermediacy, see Bolter and Grusin, *Remediation*.

36   A similar effect is obtained even more efficiently by video artist Helen Dowling in her installation *The Burning Time Slideshow* (2015), for which she covers the section of the floor in front of the screen with a shining foil that creates a reflection on the ground. This work was part of the exhibition 'Close-Up – A New Generation of Film and Video Artists in the Netherlands', EYE Film Institute Netherlands, January-May 2016.

19. Victoria Fu, *Belle Captive I*, 2013. Video installation with sound, 06:00 loop. Exhibition view, Whitney Biennial. Whitney Museum of American Art, New York, 2014. Courtesy of the artist.

projected onto a non-touchscreen: sometimes, the represented figures react to the (also represented) touch, but the installation does not allow for any interaction from the side of the spectator.

The same motif also appears in *Velvet Peel 1* (2015) by the same artist, where the Apple gesture is performed with the entire body instead of with the fingers: not only the head but also the butt are swiping. Such gestures reveal a humorous approach to the new touchscreen gesturality. Set in the same ironic tone, *Démontable* (2014) by Douwe Dijkstra also mocks the interaction solicited by touchscreens. Here, at the very end of the film, once more we have an Apple gesture represented when—after various 'adventures' taking place on the horizontal surface of a table—the hand operating the tools displayed during the film seeks to switch off an old-fashioned TV set in order to put an end to the story. It swipes the fingertips on the vertical screen from left to right as on an Apple device, enhancing a funny tone that implies a positional coincidence of the represented TV screen and film frame, thereby strengthening their shared vertical axis. Also, this gesture ironizes the illusory nature and the staged regime of the gesture, evoking a WS that is, in fact, only a DS.

In order to summarize this fourth category of our catalogue, we would like to maintain that—reproducing a model structured around a double verticality—the aesthetics of desktop cinema seems to imply a viewer who is

kept at a distance. Despite the familiarity of the computer environment and the apparent 'communal gesture'[37] performed by the artists, the viewer is only rhetorically implied, for the films and artworks propose what is, in fact, a figuration of the interface rather than an actual one. Consequently, by way of ironic and sometimes critical narratives, the 'sense of action' emphasized by the highly displayed procedurality betrays a screenic dispositif that—as is often the case in the field of interactive arts—'at times enclose[s] one into a schema of manipulation' (and, we would add, of underrated constructedness), for the windows and the multiple vertically oriented screens appearing in the film installations do not open up a real space of interaction.[38] Without reorienting the screen, these works reinforce the traditional axial balance between horizontality and verticality as well as the separation between on/off-screen, author and spectator, WS and DS. Yet our examples underline the meaningfulness of performativity—a notion that we will further explore in our next and last category.

5. Horizontal/Vertical-Vertical/Horizontal: Tabletop Performances

Taking the performative dimension quite literally and to its pure extreme, the fifth group includes live or recorded performances that entail both the moving image and the presence of one or more screens of sorts. We shall look at Julien Maire's *Model for the Apocalypse* (2008), Gautam Kansara's *Save As* (2014), Joan Jonas' *They Come to Us Without a Word II* (2015), and Laetitia Gendre's *The Erased* (2014). These works are all complex versions of the table dispositif triggering an action that happens—by way of a performance—on the top of a table. Despite the profound differences between the themes tackled by the narratives of these four art installations, their distribution and public resonance, as well as the artists' background, they all present important similarities that favour our reflection on the conception, mobilization, and (re)orientation of the screen. Let us begin by saying that they accomplish a complete revision of the axial coordinates by positioning

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37 Lee, 'Film Studies For Free', lecture podcast.
38 Poissant, 'The Passage from Material to Interface', p. 245. For the opposite perspective on this issue, see Friedberg, *The Virtual Window*, p. 227. While Friedberg touches upon the metaphoric value of both the desktop and the multiple windows, the notion of the screenic dispositif as we propose it sits on a more concrete idea of the objects at stake, for the window can be connected to a physical, vertically oriented wall and the desk is in fact based on the model of a real horizontal table surface. Pushing beyond Friedberg's envisaged simultaneity of a virtual object being *metaphorically* both a window and a desk, we are exploring the dynamics of reorientation to offer a more *pragmatic* and hopefully complementary take on the issue.

20. Julien Maire, *Model for the Apocalypse*, 2008. View of the artist performance during the Art.Ware Festival, Hong Kong, 2010. Courtesy of the artist and Art.Ware Festival. All rights are reserved.

the screen both horizontally and vertically. Furthermore, the distinction between WS and DS is no longer applicable, precisely because of their complex axial dispositifs and their performative dimension.

In 1997, Julien Maire created the special 'slow-motion material' needed for his *Model for the Apocalypse*, which premiered as a performance in 2008 at the Shanghai Zendai Museum of Modern Art. Sitting at a table, the performing artist builds formless forms with this unique material made of micro steel balls, to which special glue is added and which disintegrates in slow motion under the glance of a camera. Behind the artist, the action is projected, as a live broadcast, onto a screen. Special software displays different points of view of the material, using a single video camera. The audience stands around the table, looking at the artist performing on the horizontal axis and simultaneously watching the footage displayed on the vertically oriented screen.

As Edwin Carels observes, it is a setting or dispositif that 'conflat[es] real-time perception with mediated vision'.[39] The temporal sense of extension conveyed by both the slow motion of the material and the long duration of the performance might echo the spatial extension of the performance from the horizontal space of liveness to the vertical one of detached representation. As

39   Carels, 'The Productivity of the Prototype', p. 181.

for the viewer, this slow motion spectacle is consumed from a safe distance, without direct interaction.

The same is true for Gautam Kansara's *Save As* performance, recorded and projected as a single-channel HD video, first exhibited at Shrine Empire Gallery in New Delhi in November 2014. It reflects upon the issue of memory by coupling a highly bodily and material treatment of various substances with the intangibility of digital technology, translating the contrast onto the visual level and paying specific attention to the mechanisms of focusing, re-focusing, storing, updating, and overwriting through the 'save as' option. Projected onto a glass table, we see some moving images recycled from previous videos by the artist.[40] A concrete universe is added to the virtual one by the artist's hand, which also appears in the frame: this physically added layer is made of simple, rough materials (flour, liquid, bleach, etc.) and white paper clippings used in the actual performance. Evoking in a quite uncanny fashion the postcard sequence in *Les Carabiniers*, Kansara, who is standing in front of the table, throws these paper clippings on the horizontal surface, while a camera records his gestures from above. The resulting image is projected onto the gallery walls. Bearing in mind the experimentation of desktop cinema, and catching the allusion to digital technology brought by the title, the pieces of paper remind us of computer windows, overlapping one another and with images overflowing outside the multitude of frames. The screenic orientation is similar to that of Maire's *Model for the Apocalypse*: at the core is the *coexistence* of a horizontal screen (i.e. the table) where the performance takes place, and of a vertical one (i.e. the wall) where its spectacle is offered to the eye of the non-interactive, contemplative spectator.

Joan Jonas' *They Come to Us Without a Word II* (2015), which complemented her video installation representing the United States at the 56th Venice Biennale of Art, is a live performance that ran for three nights at Teatro Piccolo Arsenale in July 2015. Proposing a dispositif that the artist has been experimenting with for decades, the piece is based on a simultaneous projection on the multilayered vertical screens located at centre stage of what Jonas performs on the laterally placed table.[41] In addition, jazz composer Jason Moran creates a live score to the performance, playing his piano on the opposite side of the stage. It is as if the artwork would result not only

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40   See https://gautamkansara.wordpress.com/save-as-2014/. (Accessed 4 April 2017).

41   See, for example, *Reanimation* (Hangar Bicocca, Milan, 2014), where the artist revisits her earlier work *Disturbances* (1974), in which an investigation of surfaces and mirrored, extended spaces was already inspiring her. See also Reynolds, 'How the Box Contains Us', pp. 20-29.

from the intermingling of mixed media but also from an encounter between hands—Moran's action of touching the keyboard resembling Jonas' hands on the table surface, before they become part of the vertically projected image.

Laetitia Gendre's *The Erased* (2014) is another installation that combines both the horizontal and the vertical axes. In Gendre's piece, the artist's performance is not live but recorded as part of a video slideshow. The installation consists of a black table with a huge black-boxed folder on its top, lying open and containing white sheets with line drawings. The drawings are contour tracings of the various panel compositions constituting Aby Warburg's *Mnemosyne Atlas*; however, all the panels' visual contents are 'erased', resulting in empty frames. On the wall next to the table, a video slideshow is projected, showing the drawings inside a box that the spectator is not allowed to touch. The randomly generated split-screen framing of the video slideshow editor turns the whole into a digital *mise-en-abyme* of Warburg's *Atlas,* completed by the appearance of a white gloved hand—the hand of the archivist/artist—whose index finger points to some invisible details. This mixture of analog and digital gestures is not directly accessible to the spectator, whose viewing mode is nevertheless shifting between horizontality and verticality, between looking down at the 'real' drawings in the black box and frontally facing their electronically projected images. As the artist explains it, the slideshow video is 'directly related to the idea of the screen, in the sense that it is symptomatic of the use made of this kind of software for digital photos, and there is also an allusion to the search engines on the Internet'.[42]

If desktop cinema testified to the possibility to use and thus conceive of the computer screen and its interface as a stage for film, the tabletop performances of our last category adopt the same logic reinterpreting it. Hence, by translating the same 'cinematic' stance into a more theatrical realm, the screen looks like an extension of the stage. This is not only motivated by an expressive research that is directed towards the territories of performance but also by an undivided attention to the process in its *happening*. We are presented with a documentation of things as they are taking shape and of events as they unfold: what in desktop cinema was a real-time rhetoric here becomes liveness (even if recorded, as in Gendre's *The Erased*). Similarly, from a desktop that was intended as stage, we move here to an actual stage. Moreover, the performing artists accomplish this shift that multiplies the stage surfaces by including a number of areas and spaces in the setting that allow the disruption and enhancement of its physical dimensions. As

42   Email conversation with the artist, 27 January 2016.

a consequence, the angles from which the image is made available to the spectator are also multiplied. Since a multitude of operating surfaces is included in the artworks, the viewer is then enabled to pragmatically search for new positions and ways to look at the image, to shift from one position to another, and direct his or her gaze from one surface to another. In other words, many surfaces are offered: they superimpose on top of one another, sometimes clashing, taking shape in real time before our eyes; consequently, at times we cannot see them at all from our position—this is where the screenic dispositif (be it a WS or a DS, or both) is called into play in order to transfer the image onto a diverse, differently oriented and more visible area, most of the time perpendicular to the one where the action is actually taking place.

Conclusion: Authorship vs. Spectatorship?

The effective axial reorientation of the screen in the last category does not afford more interaction or interactivity than in most of the other case studies, insofar as the tabletop performances similarly preclude the spectator from participation: he or she is engaged by the live dimension of the artwork and yet is excluded from the displayed gesturality given his or her fixed, separated postures. Table installations, as discussed in our first category, allow instead for the concrete participation of the viewer.

Both the first and the last category feature a strong gesturality. In the table installations of the first category, it is a gesture that belongs directly to the spectator and constitutes the basis of the interaction that is essential for unfolding the installations' potential. And in the tabletop performances of the last category, the action is the necessary element for the performance to take place but belongs solely to the author. In axial terms, it is evident that horizontality is connected to a sphere of practicability and authorship, whereas verticality is the orientation directing the spectator and informing the more passive stance of watching. But reality offers many nuances in between these two opposite poles. Table installations do indeed propose a horizontal surface onto which the spectator is invited to direct both gaze and gesture. Yet by touching the horizontal surface, the spectator becomes, in fact, a producer. Spectatorship shifts, therefore, towards authorship, substantiating the connection between horizontality, action, and production.

As for the tabletop performances, we tried to demonstrate that these types of experiences do not alter the traditional exhibition (and cinematic) dispositif, which tends to see authorship and spectatorship as two non-interacting, distinct spheres. If such separation seems to be softened in

temporal terms—for liveness implies a real-time temporality without delay between the event happening on the horizontal table surface and its image projected onto the vertical frame of the screen—this passage obviously requires a spatial fracture. Put differently, temporal proximity finds its own counterpart in the spatial element because the traditional dispositif works as a sort of detaching device that allows us to see it at the cost of taking the image away from its source. Underscoring a rupture from the action that created it, gesturality and looking, authorship and spectatorship are thereby distinguished. However, we still believe that these performances challenge the axial coordinates, since a way to connect horizontality and verticality is definitely at the centre of the artists' expressive searches; in this sense, the image of the performer's hand and its metaphors (be it a pointer or a cursor) stand most likely as an attempt to bridge these two dimensions.

This is not a novel effort, as our discussion of Gianikian and Ricci Lucchi's *Essence* as well as Godard's postcard sequence has made clear; yet in the performance installations of the fifth category, such an attempt is newly proposed and reinterpreted by shifting from a cinematic to a more markedly performative language. Despite the spatial separation of the screenic dispositifs, their co-existence on stage and the temporal coincidence of the action/image featuring both the table and the screen establishes a *trait-d'union*, an in-between space. It is a threshold where the opportunity for reorientation might be developed, an area where authorial and spectatorial stances are put in communication. Here, a mixture between the two is negotiated by means of the simultaneous usage of the horizontal and the vertical screenic spaces, as well as of the performer's gesturality and the (possible revisions of) the spectator's posture. We would like to qualify this threshold as a conceptual playground, as an extension of the children's playground we described in our account of floor screens. Adopting Victor Turner's notion of play, we can then maintain that those who play—author and spectator—are agents of change: what actually changes is the orientation and, thus, the way of thinking about the screen via its usage.[43]

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43   Turner's concept of play is to be connected to his broader anthropological thought, according to which cultural performances entail a ritual potential that may lead to a change, envisage a shift, or formalize a state of transformation and passage. Inextricably bound to the creativity that is produced in such circumstances, play is a *summa* of deep and symbolic values, a condensation of traditions, habits, and beliefs but, at the same time, is a liminal action performed in a threshold space (among which are the playground and the kind of liminal spaces we tried to sketch out in our catalogue of screenic dispositifs). As such, it may well give room for novelties, original inclinations, and reorientations that determine a passage and may therefore be taken as a model for change. Turner, *From Ritual to Theatre*.

Pragmatically tested through play, the various uses of the screenic surface revise the traditional ones: they enhance, challenge and—most of all—displace and re-place the screen itself along a new axial direction. In the frame of a reflection about performance, the PC-based environment, and its interfaces, Marshall Soules claimed that

> [e]ach machine or new technology contributes an idiomatic orientation to the message it conveys, and much of the critical writing on hypermedia is concerned to varying degrees with attempts to characterize the idiomatic proclivities of the digital medium.[44]

Hazarding a quite literal interpretation of Soules' point, by way of conclusion, we might well try to relate it to the case studies composing our catalogue. What our journey across the axial orientation of the screen and along its pretended or actual innovative dispositions finally leads us to claim is that observing a wide set of screenic variations and modulations hopefully enables us to highlight a threshold where horizontality and verticality, doing and seeing, authorship and spectatorship can meet. Moving through this playground, we have encountered table installations, book browsing, carpet and floor screens, desktop cinema works, and tabletop performances—categories that are all nuances describing the varying axial inclinations defining the orientation of the screen. Such variations open up room for multiple forms of gesturality, thereby creating new 'idiomatic proclivities' of the screenic image.

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44   Soules, 'Animating the Language Machine', p. 329.

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10. 'Nothing Will Have Taken Place – Except Place': The Unsettling Nature of Camera Movement

Tom Gunning

Abstract

In 1897, Stèphane Mallarme threaded this phrase through his culminating work of modern poetry 'Un Coup de Des'. Michael Snow, commenting on his 1967 film *Wavelength*, another radical work of modernist vision, invoked Mallarme's phrase and sets us thinking about how the moving image recreates/explores/questions the nature of place. The radical role of the moving image in providing new modes of our experience of space has been neglected or simply presented as a deviant deconstruction of a dominant commercial narrative cinema. Taking seriously the way the moving image provides new tools for our understanding of our place in a technological world, I will discuss moments of camera movement and the mobile frame in cinema practice, both commercial and avant-garde, historical and contemporary.

Keywords: Cinema, place, space, radical modernism, camera movement, avant-garde

Space and Place

In his classic work of cultural geography, Tuan Yi-Fu distinguished between the categories of space and place. Place, he claimed, is security, while space is freedom. Space is associated with movement, while place appears as a pause, a location we dwell on. Place becomes associated with home, with specificity, while space implies potentiality and possibility. But the relation

between space and place can be transformative.[1] Tuan's field of cultural geography studies how humans (and some animals) transform space into a place of significance and habitation. We can settle down or move on. But should we set up an absolute dichotomy between place as rest and space as movement? Patterns of movement exist that align mobility with places (roads, cycles of migration of nomadic tribes, distant horizons). While in our everyday lives we might seek primarily to find a place to settle down, nonetheless the uncanny nature of the human, as is described in the famous chorus in Sophocles' *Antigone*, also drives us to pull up stakes and venture forth into the farther reaches of space. Following Russian Formalist Victor Shklovsky's rooting of the work of art in a drive to renew perception by tearing away layers of habit,[2] we could describe art itself as the process whereby place is transformed back into space and the security of the familiar and domestic opened up to the adventures of unbounded mobility.

Thus the recent film *Gravity* (Alfonso Cuarón, 2013) does not seem to me primarily to engage its audience in a suspenseful journey of a return to place from literal outer space (although that narrative is certainly there and allows narratively driven viewers to feel satisfied). Rather, the film's great attraction lies in marshaling the current state of the art of cinematic control of image and sound to create a fusion of the exhilaration and the terror of the feeling of becoming untethered from any place, of floating in space. The buoyant loss of gravity the film creates goes beyond the powerful invocation of the fantasy of flight realized in *Avatar* (James Cameron, 2009). We float, profoundly abstracted, in an intensely visual, non-tactile, yet almost overwhelmingly kinesthetic realm of the senses that we rarely, if ever, experience. Pitched between infinite liberation and absolute vulnerability, as viewers we cling to these astronauts in a space that feels paradoxically both intrauterine and utterly unbounded. Even the most elementary orientations of place—up and down—are abolished by a camera and a viewpoint that has no ground, no consistent horizon, only a constantly shifting sensation of the unwilled movement of bodies in space. The freedom of the virtual camera of the digital realm matches director Alfonso Cuarón's brilliant use of the possibilities of the Atmos sound system, which does not simply surround us but constantly surprises us as sound pulls us upward as well as circling about.[3] The suspense of the heroine's struggle to find a place within

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1   Tuan, *Space and Place*.
2   Shklovsky, 'Art as Technique'.
3   Dolby Atmos is a new audio format for creating and playing back multichannel movie soundtracks. It was developed to give movie sound a more three-dimensional effect.

a homeward-bound vehicle reflects not only the logic of a plot based in space travel but also the viewer's growing desire to place her own seat within this gravity-less world, to reassure herself she is in a theatre placed before a spectacle rather than becoming lost within it, possibly never to return.

As Shklovsky was well aware, the means of art are both technical ('art as technique' is one translation of his most famous essay) and historical. The canonization of styles dulls the edge of techniques of defamiliarization, which need to be renewed with unfamiliar or forgotten devices. These cycles may even, as art historian Heinrich Wolfflin claimed, alternate between open and closed forms, as harmonic and symmetrical styles replace the baroque emphasis on motion and unbalance and vice versa.[4] But I would claim that aesthetics (understood as an analysis of the devices of art more than its hierarchy of values) has never fully digested the technical novelty of what we can call generically 'the moving image'. I have tried to stress in recent years the way movement redefines the nature of the image and perhaps even undoes the concept. Images remain placed, whether in a frame, on a wall or ceiling, on a screen, or in our hand. But a moving image, even if it is in some sense still placed on a screen, leads us beyond that placement, exceeds its borders even if only virtually. It has often been assumed that the invention of the moving image (whether in 19th-century philosophical toys, the invention of cinema, or the advent of video or computer screens) was simply the result of the Western thirst for a realist illusion (as if we know what that oxymoron means), a new means of more accurately representing the world. More than its mimetic role, I want to stress the moving image as a device, a means by which we can play with our perceptions and our sense of place and space.

The double nature of cinema as a moving image remains under-theorized, especially in comparison to the dominant syntax of cinema, editing. Instead of the discreet articulation and differentiation of space and time that editing embodies, movement consists of flow, the merging of space and time. The double aspect of movement in cinema includes, first off, the movement contained in the image itself: the depiction of people and things in motion, the actual animation of the image. This production of motion was based on the perceptual paradoxes of the philosophical toys fashioned in the 19th century, which fused the nature of human sight with the possibilities of speed and precision offered by simple mechanics. But the movement

Traditional 5.1- and 7.1-channel surround setups deliver sound using speakers placed all around the auditorium.

4   Wolfflin, *Principles of Art History*.

of images created by the movie camera/ projector is compounded, and perhaps confounded, by the mobility of the camera itself, its ability to change perspective or even location. As my colleague Daniel Morgan has observed, 'despite their prominence within the history of cinema, camera movements have remained surprisingly marginal and elusive in critical work'.[5] This neglect contrasts sharply with the almost foundational role that editing has played, not only in film stylistics but even more in film theory. Whether vaunted by theorists from Sergei Eisenstein on as constituting the essence of cinema, or forbidden as a form of cinematic trickery, editing tends to foreground significance over space.[6] Editing can abstract details from space, either through framing or through switching to another space. In editing, space is overcome or, in a relative sense, abolished.

Camera movement, on the other hand, seems to make us aware of space itself, its continuity and extension. Furthermore, it seems to place us as viewers within space as if we not only observed it but moved within it, discovering its new aspects and dimensions. This is a tricky claim, since as cinema spectators we always literally remain outside the space of the film. But the role of camera movement often seems to make us approach deeper into the world of the film, to merge into it. We become in some sense immersed. As Morgan put it when describing a camera movement in Hitchcock's *Vertigo*: 'For a moment, we are within the world of the film.'[7] We must acknowledge, of course, the gulf between the space of the viewer and that portrayed in a film space. There remains an absolute difference between the three-dimensional space a cinema spectator dwells in and the virtual space portrayed on the screen.

But there are different ways to portray space based on the choices made of both media and stylistics, which entail different ways that viewers can experience the space of an image. A flat surface can seem recessive if perspective systems are employed in an image, or less recessive if certain techniques, such as foreshortening, are avoided (as in Persian miniatures). Likewise, varying lenses in photography can create different senses of space (the distortion of a prismatic lens; the collapsing of planes through a telephoto lens). The movement of people or objects within a cinematic image can convey a sense of depth through changes in relative size or the changing

5   Morgan, 'Max Ophuls', p. 127.
6   Sergei Eisenstein's theory of the primacy of montage in film is first articulated in 'Bela Forgets the Scissors' (1926) and 'The Dramaturgy of Film Form (The Dialectical Approach to Film Form)' (1929). See Eisenstein and Taylor, *The Eisenstein Reader*.
7   Morgan, 'Where Are We?', p. 228.

overlap of figures. The movement of the camera marshals its own spatial cues not only of depth but also of a sense of penetration (or withdrawal) into the virtual space as the frame line bordering the images changes with the movement of the camera. While still maintaining its virtual nature and separation from the viewer's space, nonetheless during camera movement the image and its borders slip in relation to our viewpoint, revealing aspects previously hidden or concealing ones previously seen. Thus a sense of being 'within the world of the film' while never abolishing the ontological gulf between viewer and image comes partly from shifting our orientation within space through the movement of the camera. Our sense of place within the film becomes mobile and shifting rather than fixed; not only does space change, but we seem to move with its shifting viewpoints.

Theoretical discussions of camera movement, even including Morgan's insightful essays, have tended to focus on the role that camera movement play within narrative film. In this context, the movement of the camera provides access to the diegetic world through its relation to characters and point of view or its role as a narrating agent, drawing our attention to the significant elements of the fictional world. As crucial and complex as these issues are, I am interested in something less exclusive, which exists not only in narrative but also documentary or lyrical/experimental films. This could be described as the way camera movement places—but also displaces—the viewer within a film. I want to explore less our imagining of fictional worlds than the games that camera movement plays with our sense of virtual motion. I call it 'virtual' to acknowledge the fact that camera movement in cinema does not actually transport us physically; we stay fixed in most circumstances in a single viewing position. However, we also perceive a sensation of motion, both visually and kinesthetically, and even in some cases (as in *Gravity*) aurally.

Thus, the centre of my discussion lies in exploring the way the moving image—and even more specifically the image of movement given by the mobile camera—transforms our relation to the image. Rather than tracing the narrative possibilities this new form of imagery brings in its wake, I will pursue its affinities with the modernist project to transform the image and our relation to it—not only in cinema but in other visual arts and in poetry. Movement and its relation to the viewer will provide my clue to understanding this transformation. This topic could be an epic undertaking, and luckily a number of fine scholars have already tackled aspects of it. Most recently Christopher Wall-Romana, Pavle Levi, and P. Adams Sitney have all explored the affinity the moving image has with modernist practices

during the 20th century.[8] I will offer here a modest tracing of the way the concepts of space and place can guide us in understanding the horizon opened by the practice of the image in motion.

Taking Place: The Avant-Garde Contemplates the Cinema

My discussion will take the form of a boomerang. First I want to follow how movement, as made available by the cinema, shook up other forms of modernist art. But I also want to return this modernist sense of the radical possibilities of motion to the practice of cinema in order to better grasp the radical possibilities of camera movement.

The title for this talk comes from an essential text in the history of modernism, Mallarmé's masterpiece, the poem known as *Un coup de dés*.[9] This work revolutionized the visual presentation of modern poetry, using typography to transform the relation between reader and text, including invoking the rocking of a ship in the process of shipwreck through the arrangement of words on page. Christophe Wall-Romana has called this work 'the first modern visual poem' and, even more daringly, 'the first poem mediated by cinema'.[10] Different type sizes not only introduce sudden shifts as we read the text but also link words of identical type size across the poem, in spite of being interrupted by other words and phrases. Thus a large typeface links together the phrase I use in my title: 'RIEN [...] N'AURA EU LIEU [...] QUE LE LIEU' generally translated into English as 'Nothing will have taken place except place'. I will not attempt here a full exegesis of this amazing work or this ambiguous phrase (and I must confess my discussion of this text remains superficial and formal and limited to my topic). Rather, I will use this phrase as an emblem for the uncanny effect of camera movement: its transformation of space into place and vice versa.

It is the ambiguities, perhaps the ambivalence, of camera movement I wish to stress: its alternation between establishing a place and undoing the stability of place through unpredictable movement. I believe movement's lack of stability explains why editing—so easily (if often misleadingly) compared to language, syntax, or even grammar—has dominated theories of cinema. Editing tends towards the systematic, while camera movement seems to enact the ungraspable and dynamic aspects of change. Thus the

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8   Wall-Romana, *Cine-Poetry*; Levi, *Cinema by Other Means*; Sitney, *The Cinema of Poetry*.
9   Stephane Mallarmé, 'Un Coup de Dés'.
10   Wall-Romana, *Cine-Poetry*, p. 55.

very possibility of a moving image inspired the classic avant-garde move-ments at the beginning of the 20th century. The responses that modernist artists produced to the possibility of a moving image were by no means restricted to experimental films. Given that the expense and complexity of the technology of the cinema kept it out of the hands of many artists, one might claim that the main contribution that moving images made to the avant-garde lay in the way it influenced works in other media, a process Pavle Levi has called 'cinema by other means'.[11] Nor is this restricted to the more obvious mimetic imitations of the sweep of motion found in Futurist paintings or Marcel Duchamp's *Nude Descending a Staircase*. The challenge that the moving image of the cinema offered to modernist artists went beyond imitating the depiction of movement. Radical works in poetry, collage, and sculptures invoke, as Levi claims, not only movement but also the complex apparatus of the cinema: camera, projector, and screen and their relation to a viewer. Examples include such central modernist works as Mallarmé's poem; Duchamp's *Large Glass* (as Linda Dalrymple Henderson has demonstrated); Picabia's mecanomorphs (as George Baker has revealed); cubist paintings and collages (as Bernice Rose has claimed); the cine-poems that Wall-Romana analyzes, beginning with *Un coup de dés*; and the range of international avant-gardist works Levi assembles.[12]

The advent of cinema at the turn of the century encouraged the avant-garde to crash through seemingly solid barriers and gave birth to new ways of thinking about and making art based on the mobile perception that cinema offered. The early 20th-century fascination with movement as an aspect of our perception and understanding of the world is perhaps clearest not only in the writings of Henri Bergson but also in their rather surprisingly widespread reception and popularity.[13] But a new awareness of the mobility of perception goes beyond the interest in Bergson's concepts of intuition shown by the cubists and other visual artists, extending even to artists antipathetic to Bergson, such as Duchamp. Not only artists but also theorists such as the linguists Roman Jakobson and Victor Shklovsky explored new dynamic concepts inspired by the cinema. Jakobson, speaking retrospectively of his youthful avant-gardist impulses, declared he saw the 'overcoming of statics' as 'the essential turn for the new era'.[14] In his field

11   Levi, *Cinema by Other Means*.
12   Dalrymple Henderson, *Duchamp in Context*; Baker, *The Artwork Caught by the Tail*; Rose, 'Picasso, Braque, and Early Film in Cubism'.
13   Bergson, *Creative Evolution*. See also Antliff, *Inventing Bergson*.
14   Jakobson, *Verbal Art*, p. 11.

of linguistics, Jakobson saw such static conceptions as a flaw in Ferdinand Saussure's understanding of the synchronic system of language.

> In criticizing this conception I referred, by no means accidentally, to the example of cinematographic perception. If a spectator is asked a question of synchronic order (for example, 'What do you see at this instant on the movie screen?') he will inevitably give a synchronic answer, but not a static one, for at that instant he sees horses running, a clown turning a somersault, a bandit hit by bullets.[15]

Unlike words, cinematic images moved and in this respect reflected a dynamic interrelation with the world in time and space. Thus, Mallarmé and the modern poets who followed him sought to give even the signifiers of their work—the arrangement of letters on the page—the impulse of dynamic movement and to convey this sensation to the reader. The new modern environment of cinema provided constant examples of this transcription and perception of motion. Besides the teeming motions of modern life, new modes of transportation awakened new modes of perception, such as the panoramic vision that Wolfgang Schivelbusch describes. According to Schivelbusch, 19th-century passenger trains seated passengers in upholstered comfort that resembled a secure bourgeois living room, while from the window they observed a rapidly changing visual perspective of the moving landscape, recalling the painted panoramas of landscape offered as visual entertainment.[16] Not only did the things of the world move but also our viewpoint. Mallarmé was keenly aware of these new possibilities of perception and somewhat mischievously entered into a discussion of automobile design with a journalist.

> The coach, with its team of horses requires the inconvenience of a driver blocking the view [...] Something entirely different will have to come about. A bow window opening unto the space that one moves through magically, with nothing in front: the mechanic is placed in the rear, with his upper body above the roof, to steer like a helmsman. Thus the monster advances in an innovative fashion. This is the vision of a passing man of taste, putting things back in perspective.[17]

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15   Ibid., p. 12.
16   Schivelbusch, *The Railway Journey*, pp. 52-68.
17   Mallarmé quoted in Kittler, *Gramophone, Film, Typewriter*, p. 287, fn. 121.

The forward-moving view through an unobstructed windshield functioned like a movie screen. The moving viewpoint that Mallarmé claimed allowed the man of taste to put things back into perspective became even more dynamic as the mechanic/chauffeur gave way to the driver who united vision with control of the motive impulse. Thus Henderson and Baker have both analyzed the automobile trip that Duchamp, Guillaume Apollinaire, and Francis Picabia took from the Jura Mountains to Paris in 1912. The vision of the automobile's headlights cutting through a dark and stormy night gave Duchamp the image of the 'headlight child', the 'divine blossoming of this machine-mother' and thus planted the seed for *The Large Glass*, which Baker describes as 'a work of art that would not longer *represent* but *embody* motion and transformation'.[18]

'The Monster Advances in an Innovative Fashion': The Mobile Spectator

While cinematic movement most obviously and universally consists of action occurring on the screen, it was the effect of this movement on the viewer that most fascinated the avant-garde. Although André Breton's fascination with cinema may have been somewhat short-lived, it clearly helped him articulate an understanding of the central experience of surrealism as *dépaysement*.[19] This term can be translated as disorientation, or more literally as 'change of scene', 'change of venue' in the legal sense, or even expatriation. Within my context, I think we could translate it as 'displacement' especially in the sense I have been developing: moving from the security of place into the uncertainties of space.

Movement in the cinema—especially camera movement that literally uproots our position—can be unsettling, as it displaces us. Of course, the context of the movement—where it goes and where it ends up, and especially its relation to narrative expectations—can also settle us down. But I find it instructive as a historian of cinema that camera movement not only appeared early in cinema history (with the Lumière productions in the 1890s) but could claim to have had an early period of great popularity (around 1906) followed by a relative stagnation through the 1910s after cinema became more involved with storytelling and narrative editing (as seen in the films of D.W. Griffith or Louis Feuillade) and then a later

18   Baker, *The Artwork Caught by the Tail*, p. 5.
19   Breton, 'As in a Wood', pp. 72-77. Hammond translates *dépaysement* as 'disorientation'.

rediscovery or re-invention during the 1920s from Lupu Pick's *Sylvester* (1923), Murnau's *The Last Laugh* (1924), and through Marcel L'Herbier's *L'Argent* (1928). Therefore, the early blossoming of camera movement corresponded to an early period of relatively un-narrativized films (which I have called the cinema of attractions), gradually diminishing after 1906, and its relative stagnation came with the growing dominance of narrative film.

During the era of the cinema of attractions, camera movement created a popular genre of non-narrative cinema, the Phantom Ride. These early films displayed camera movement as their chief attraction. The camera was mounted on the front (less often the rear or side) of moving vehicles: trains most frequently but also trams, automobiles, boats, and even airplanes. The films simply presented this moving voyage through a landscape and the sensations and views it engendered. In 1905 and for a few years thereafter, such films were shown in specialized theatres (originally known as Hale's Tours) that were made to look like railway carriages and in some cases included actual movement or its simulation by sound and other effects. Such exhibition contexts presented the films as 'ersatz tourism' and simulated journeys. This theatricalization of the auditorium may have also served to contextualize the *dépaysement* of the moving image itself. However, the genre frequently emphasized effects of speed and possible danger, aligning them with amusement park thrill rides. *Dépaysement* remained an attraction in itself for early film viewers of the Phantom Rides.

The succeeding decades of film history witnessed a process by which camera movement became adapted for narrative effects through a variety of key works These include *Cabiria* (Giovanni Pastrone 1914); the prerevolutionary films of Yevgeni Bauer such as *Daydreams* or *After Death* from 1915 and later *Sylvester* and *The Last Laugh*; followed by an embrace of camera movement in the late twenties: Murnau's *Sunrise* (1927) and *L'Argent* (1928), Jean Epstein's *La Chute de Maison Usher* (1929). In these films, the pure sensation of movement of the earlier films blended with narrative tasks, such as generating excitement or suspense to make cinema stories more dynamic and visceral.

After the dominance of narrative forms that crystalized in the early teens, camera movement either migrated to the less narrativized genre of actualities or travel films or it began to find codified narrative roles within fictional films. Without aspiring to a complete inventory, we could highlight such uses as pans following action or establishing a locale; tracking shots that perform more extensive but similar roles (especially following people walking or riding; movement through environments as a way of setting a scene); cameras mounted on means of transportation to film

characters riding within them. In these cases, camera movement serves primarily to follow or reveal actions rather than convey the sensation of movement—although it would be impossible to separate these two aspects absolutely. Sometimes such camera movement plays a syntactical role within the narrative, linking characters or actions, or revealing or emphasizing a detail. Camera movement can also convey subjective states of characters, as in the hand-held unsteady filming of the porter's drunken dance in Friedrich W. Murnau's *The Last Laugh* (1924). However, by the later 1920s, the avant-garde films of the French Impressionists and the Soviets thematized the pure kinesthesia of camera movement self-consciously. Friedrich Murnau's panegyric on 'a camera that can move freely in space' that Lotte Eisner quotes beautifully conveys this new aesthetic excitement over the possibilities of camera movement:

> [...] the interplay of lines, rising, falling, disappearing; the encounter of surfaces, stimulation and its opposite, calm; construction and collapse; the formation and destruction of a hitherto almost unsuspected life; all this adds up to a symphony made up of the harmony of bodies and the rhythm of space; *the play of pure movement,* vigorous and abundant. All this we shall be able to create when the camera has at last become de-materialized.[20]

This and other declarations of the possibilities of the cinematic movement in the 1920s by Jean Epstein, Germaine Dulac, or Dziga Vertov indicate a fascination with the vertiginous sensations of camera mobility that ran parallel to filmmakers' emerging mastery of narrative tasks. Murnau expresses precisely the ambivalent nature of the moving camera's relation to space and place: 'construction and collapse, formation and destruction'. With camera movement, the edge of the frame slices through space rather than serving simply to contain the image, revealing new perspectives, while it erases from view the already-seen. Thus we no longer simply depict a place or imagine space. We see enacted before us this energy of revealing and surpassing, the pulse of a previously unsuspected life.

But, with a few possible exceptions, camera movement even in these films of the 1920s appears as a sort of 'special effect', a moment lifted out of the narrative by its high degree of kinesis to create either an intensified dramatic effect (the racing between the race car and the locomotive in *Intolerance*, 1916) or a moment of descriptive lyricism (such the camera movement along

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20   Eisner, *Murnau*, p. 84.

city streets in *Asphalt*, 1929).[21] After the coming of sound, the frequent practice of reframing a shot slightly as actors shift position naturalized the narrative role of camera movement by rendering it almost imperceptible in contrast to its earlier 'special effect' quality of more noticeable camera movements. In the 1940s, technical developments in the construction of the mechanics of moving the camera, especially smaller dollies and towering cranes, and increased depth of field encouraged the use of camera movement as a way to shape *mise-en-scene* continuously and subtly in a manner that was different from, but as effective as, editing. This later *mise-en-scene* style of longer takes integrates narrative gestures of emphasis or interrelation into the very texture of space.

Thus, as camera movement became integrated into narrative style, its effects of *dépaysement* became secondary, except in moments where the narrative itself evokes the chaotic or disorienting. The turn to extensive kinesis in the cinema of effects since the 1970s is too complex to discuss here, although it does seem to indicate an increased interest in the affect of camera movement on the viewer, possibly overwhelming (although not necessarily opposed to) its narrative roles. The recent possibility of constructing camera movement digitally (not at all limited to literal 'animated' film, as *Gravity* shows) marks a new era of camera movement no longer determined by the actual physical movement of equipment or human bodies, subject only to the algorithms of the digital process. But clearly the need for more thorough theoretical and historical grounding in defining its nature goes beyond the confines of this essay. In digital cinema, the dialectic of space and place becomes as much a technical issue as a stylistic or narrative one.

Events Take Place: Towards Snow

Avant-garde cinema has often foregrounded the contradictions of camera movement and its relation to the placing and displacing of the cinematic viewer. I believe the high point of this exploration took place almost fifty years ago in a series of films made by Michael Snow at the end of the 1960s, especially *Wavelength* (1967), <---> (Back and Forth, 1969), and *La Region Centrale* (1971). In an early essay, I compared these films to the use of camera movement I had discovered in early cinema, based on their shared focus on the kinesis processes of the camera. I still find this comparison worth making, in spite of its historical leap. But I want in the final section of this

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21   *Intolerance* (D.W. Griffith, 1916); *Asphalt* (Joe May, 1929).

essay to explore more fully the way Snow took up the challenge that cinema had posed to the avant-garde at the beginning of the century.

Although *La Region Centrale* with its tour de force exploration of the relation between camera movement and location (almost three hours of images filmed with a universally pivoting camera mount, revolving at a variety of speeds, placed on a mountain in Northern Quebec) may offer the ultimate engagement with space and place in the history of cinema, I will focus on Snow's shorter film *Wavelength* due partly to the dialectical and contradictory nature of its camera movement.

Wavelength immediately makes us confront the technical nature of camera movement and its contradictory perceptual address to our bodily sense by using a zoom. Is a zoom a form of camera movement? The zoom lens allows a change of the focal length without losing focus, so that the angle of vision (and therefore the space of the image) seems to either enlarge or shrink. Unlike the standard methods of changing to a different lens, the zoom allows this transition between focal length to be seen, to occur gradually on the screen. Thus, a zoom involves no literal change in the position of the camera. The camera neither physically approaches nor retreats from the filmed object. Instead, the optical qualities of the lens change, thereby changing the scene viewed through it. Because the relative size of an object is a principal perceptual indication of movement towards or away, the zoom seems in this sense to move, or rather to move the viewer through space. However—and here enters the contradiction—other visual perceptual cues of movement, such as the shift of objects in relation to each other known as motion parallax, do not occur. We could claim, then, that the zoom gives us a mixed message: are we moving within a world, or is the image simply being transformed through enlargement? This introduces a new ambiguous optical dynamic into the moving image, a contradictory sense of space in relation to place.

The speed of the transition that the zoom lens makes can vary enormously. Most often (perhaps because of its name), the zoom is associated with rapid transitions, sudden enlargements of the image, frequently used in the 1960s to generate an exciting dynamic intensification. But zooms can also be slow and gradual (as in Roberto Rossellini's *Rise to Power of Louis the XIV*, 1966, or even as nearly unnoticeable, the zoom in *Wavelength* which slowly moves from widest angle to most telephoto over the course of approximately 45 minutes). As Snow claims, this zoom defined or determined the shape of the film which has led both to its key role in defining the genre of avant-garde film known as structural film and to some oversimplified descriptions of the film itself. Snow himself describes the zoom as 'continuous', which is

true in a sense, but not literally, since the film stutters and backtracks a bit through its use of superimpositions and even seems to readjust itself subtly at one point. Further, even if the zoom moves fairly continuously, time seems compressed as we jump at one point abruptly to nightfall. But unquestionably, the dominant impression the film makes is of a relentless zoom crossing the space of an 80-foot loft from a fixed position.

Snow described his film as a 'room and a zoom', a phrase I might relate to my dialectic between space and place. He claims that 'the setting and the action that takes place there are cosmically equivalent'.[22] I will not try to define the metaphysical implications of this statement but rather would stress that Snow sees *Wavelength* as an encounter between the place of the room and the action of the zoom, and that the film for him engages the modernist teeter-totter between an illusionist presentation of place (the loft we see in the film and the events that take place there) and a different, more abstract dynamic of the movement of the camera redefining this place into a space. He asserts: 'the room is shot as realism. It is shot the way you would see a room as much as there is a consensus about how you see a room'.[23] In other words, the room provides the familiar, the realm of common-sense appearance—very much a *place*. The zoom—the action of the lens in ever creeping forward towards its final encounter with the far wall and the photograph of the waves that is placed there—undoes this familiarity or at least transforms with it. It makes us aware not only of the film's materiality (as light reflected on the screen) but also its role as a moving image mediated by the cinematic apparatus and its relentlessly narrowing visual field. As the film unreels, the recessive space of perspective becomes increasingly shallow and ultimately flattens as it ambiguously arrives at the space of a fixed image, the photograph of seemingly endless ocean waves pinned to the wall.

The complexity of the film exceeds the context I am placing it in, and its play with time and sound are as important as its engagement with space that I am focusing on. But *Wavelength*'s redefinition of cinematic space through a particularly ambiguous form of camera movement makes it a revelatory work. Snow could have treated his 45-minute zoom simply as a gradual release from the confines of place, as our view of the loft becomes eliminated by the progressive zoom, yielding a simple movement towards abstraction. But as Annette Michelson pointed out decades ago, *Wavelength*

22   Snow, 'A Statement on Wavelength', p. 1.
23   Mekas and Sitney, 'A Conversation with Michael Snow', p. 3.

invokes narrative even as it avoids it.[24] Neither simply a story nor exclusively an abstract work, *Wavelength*, like Mallarmé's poem, explores the tension between the two forms as a cinematic dialectic of place and space. The indifference with which the trajectory of the camera moves in relation to the events that take place undoes the long history of the subjection of camera movement to narrative tasks. Of the four 'human events' (Snow's phrase) that occur in the film, two are mundane (the delivery of a case of shelving and two women listening to the radio), while the other two—the invasion of the loft by a man who falls dead and the discovery of his body by a young woman who telephones someone to come and help her—are potentially dramatic.[25] But the zoom treats all the events equivalently, moving towards and past them without pause or deviation. As the zoom passes over the body towards the far wall, no culminating of escape or summoning of the outside world takes place. Compare this to another film confined to a single urban interior and crisscrossed by relentless camera movement—Alfred Hitchcock's *Rope* (1948). Hitchcock's continuously moving camera pokes its nose endlessly into narrative details, building suspense and curiosity. *Rope* ends with a summons to the outside world through diegetic sound as Rupert fires a revolver out the window. The zoom in *Wavelength* expresses, as Annette Michelson stressed, a relentless sense of destination and intention,[26] yet its relation to the events remains suspended rather than suspenseful. Instead of heading out of the windows seen at the end of the loft, *Wavelength* ends with the camera fixed on the photograph and the image's absolute fusion of flatness and recession—the space of an image as much as an image of space. What exactly has taken place here?

The technical nature of the zoom—its contradictory relation to movement through space—penetrates *Wavelength* to its core. Stylistically, the zoom has been condemned as an unnatural technique, creating an almost queasy uncertainty about how it relates to our perception and experience of space. It performs a purely optical transformation of space. While a tracking or dolly shot cannot be said to correspond exactly to the perception of a person moving through space, nonetheless such actual camera movements include more of the perceptual cues of spatial movement than does the zoom, which eliminates the motion parallax. The zoom feels strangely disembodied: as if our eyes moved forward without the orientations of our body following. Some critics and viewers have objected to this disembodied aspect of the

24 Michelson, 'Towards Snow', pp. 30-37.
25 Snow, 'A Statement on Wavelength', p. 1.
26 Michelson, 'Towards Snow', p. 33.

zoom, feeling that it violates an essential cinematic realism.[27] However, modernists such as Snow are involved in complicating and even contradicting the familiarity that such realism relies on. We return to one of the great paradoxes of camera movement, its relation to our body. On the one hand, due to its kinesthetic affects, camera movement seems to root the viewing experience in the body by invoking the sensations of passing through space. The recurrent use of scenes filmed from roller coasters, whether from an avant-garde film like René Clair and Picabia's *Entr'acte* (1924), a narrative film like Maurice Elvey's *Hindle Wakes* (1918), or the wrap-around spectacle of *This is Cinerama* (1952), demonstrates the physical thrill such camera movement can deliver to viewers in a variety of contexts.

But while this sort of affect, basic as well to *Gravity*, returns us to the sensory realism possible in cinema, we must remember that this remains a virtual affect. Such scenes fascinate us partly because we know we are not really seated in a roller coaster but remain in a theatre seat. The motion we experience is both physically tangible and in some sense imaginary, the effect of the unique moving image that cinema manages. The truly avant-garde impulse in cinema, like the modernist works in other media inspired by the moving image, seem to me never to simply deny *or* destroy the impression of 'illusion' or 'realism' that cinema is capable of engineering. Rather, the game consists of engaging with this impression, playing with it, complicating and even contradicting it. Recall that Murnau described the play between destruction and construction that he felt camera movement could accomplish as dependent on a 'dematerialized camera'. While the phrase may smack of idealism to some critical ears, I think in fact it returns us to the central transformation the moving image and especially camera movement carries out. We seem to enter the world of the film and yet we know we remain outside it. We are torn in orientations between the familiarity of place and the unsettling potential of space.

The zoom invites us to inhabit an impossible body, stretched between a position in space and an almost violent ability to surpass it. Thus, in one of the most experimental explorations of camera movements in film history, Hitchcock decided to fuse these contradictory forms of camera movement, the disembodied zoom and the all-too-bodily dolly-in. To convey what? The experience, precisely, of vertigo. At the climactic moment of the eponymous film, Hitchcock, at great expense, constructed a shot in

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27   See the discussion of the zoom by Belton, 'The Bionic Eye', pp. 20-27 and the controversy about its original publication in *Film Comment* (Oct. 1980).

which these contradictory visual sensations would occur simultaneously, to convey Scottie's experience as his acrophobia prevents him from saving the life of his true love. Hitchcock filmed the staircase of the bell tower in a shot that zooms out as it dollies in and vice versa. As these contradictory optics cause the spiraling space of the staircase to stretch and collapse, any consensus about how we see a place is torn to pieces before our eyes—as Hitchcock knew it would be. Amazingly to mark this moment of mental and narrative breakdown, Hitchcock pushes camera movement to its breaking point.

So does Snow in *Wavelength*. As the zoom reaches the crescendo of its narrowest angle of view and the abstract sound attains the highest point of its glissando, the frozen image of waves blurs and disappears. We witness less the denouement of a story than the final unreeling of a film, a demonstration of cinema's relation to space and place. As Snow says concerning his film: 'Events take place'.[28] Or as Mallarmé wrote, 'Nothing will have taken place but place'.

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28   Snow, 'Passage', p. 63.

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11.   The Phantasmagoric Dispositif: An Assembly of Bodies and Images in Real Time and Space

Noam M. Elcott

Abstract

This essay aims to identify, historicize, and theorize an image-spectator relationship best characterized as phantasmagoric: the actual (or apparent) gathering of human beings and images in a single time-space continuum. The first two sections locate phantasmagoria in relation to art, film, and their respective corpuses of criticism and theory. The third section situates phantasmagoria alongside two related dispositifs: the cinematic (images set at a distance) and the domestic (images enclosed in objects). The fourth section identifies the salient qualities of phantasmagoria in relation to corporeality, space, and time. The final section returns to the works of McCall, Whitman, Viola, Campus, and Oursler. The article demonstrates the importance of dispositifs—not only their subtle variations but also their stark and enduring differences.

Keywords: Phantasmagoria, film installation, video installation, Expanded Cinema, dispositif, media archaeology, spectatorship, augmented reality

Resurrection Redux

In this exhibition, a luminous figure—representing sometimes a skeleton and sometimes the head of some eminent person—appeared before the spectators, who were seated in a dark chamber. It grew less and less, and seemed to retire to a great distance. It again advanced and consequently increased in size, and having retired a second time, it appeared to vanish in
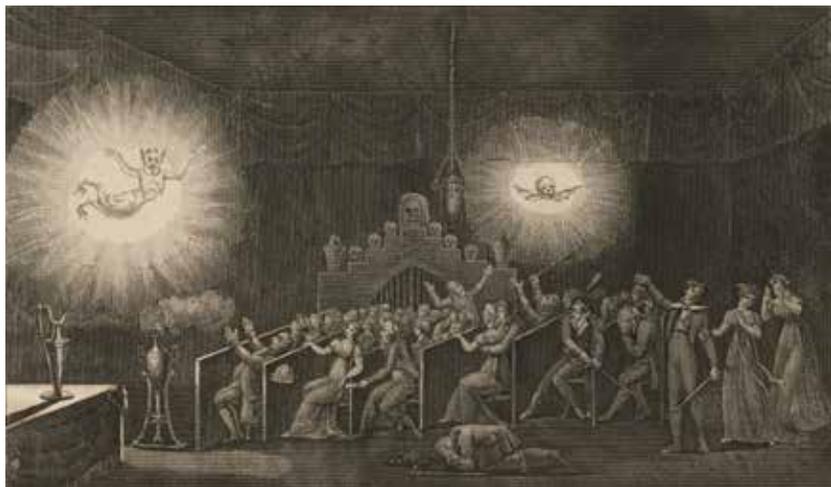
21. The Phantasmagoria, frontispiece from Étienne-Gaspard Robertson, *Mémoires récréatifs, scientifiques et anecdotiques,* 1831-1833.

22. Gary Hill. *Tall Ships*, 1992. Detail from sixteen-channel video installation, silent, 10 × 10 × 90 ft. Photo: Mark B. McLoughlin. Courtesy of the artist.

a luminous cloud, from which another figure gradually arose and advanced and retreated as before.[1]

The piece is a kind of cave- or underground-like hall—very dark [...] From an unseen source black-and-white images of twelve different people are projected all along the walls [...]. When you approach the image, say, of a distant seated person and stand before her or him, she or he responds to your presence by getting up and walking straight up to you, there to remain, 'life-size', for a longish period simply standing and looking at you. If you leave, or if you stand there too long, the person turns around and goes back to the original spot and sits down.[2]

Two exhibitions separated by two hundred years. The first premiered officially in 1790s Paris—an earlier version was staged in Leipzig—and spread to European capitals like London. Part enlightened entertainment, part haunted house, the Phantasmagoria, like its descendant two hundred years later, refused categorization as mere magic lantern spectacle.[3]

It is not a frivolous spectacle; it is made for the man who thinks, for the philosopher.[4]

What may appear on one level as just another art world spectacle has a much deeper resonance, reaching through layers of careful decision making as to how the final effect might be incited within the phenomenology of viewing.[5]

The second exhibition, *Tall Ships* (1992), an installation by the video artist Gary Hill, premiered in Kassel, at Documenta IX, and was soon shown at the Whitney Biennial in New York (1993) and other international venues. As in the Phantasmagoria, a 'sepulchral' atmosphere pervaded the exhibition's

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1   Brewster, *Ferguson's Lectures*, pp. 264-265.
2   Quasha and Stein, 'Tall Acts of Seeing', p. 189.
3   Robertson's Phantasmagoria was the most famous of several late-18th and early 19th-century attractions where spectators were immersed in darkness and ghoulish figures were projected on translucent screens or clouds of smoke such that they appeared to occupy the same space as the spectators. For an overview of the original phantasmagorias, see Mannoni, *The Great Art of Light and Shadow*, pp. 136-175.
4   Robertson, *Mémoires récréatifs*, p. 278.
5   Morgan, 'Gary Hill', p. 7.

darkness.[6] And the darkness, in turn, induced life-and-death encounters—
'one couldn't help intermittently fantasizing that these colourless, even
wraith-like, yet curiously attractive figures were, as one imagines them,
the recently dead, returning for some warmth of last contact with the liv-
ing'—and, more crucially, fulfilled the technical requirement whereby the
images abandoned the wall and entered, as quasi-animate beings, the same
space as the spectators.[7]

> *One must paint a portrait of the deceased on glass with turpentine paints
> and* (*this is the principal point*) *cover the entire background of the drawn
> figure with thick, black oil paint.* [...] *The optical trickery is imperceptible;
> because the contour of the figure is covered in thick, black oil paint, no light
> is visible on the smoke except for that presented by the luminous image.*[8]

> In actuality the video image is a frameless continuum: in *Tall Ships* the
> images have been freed into the materiality of real time and space.[9]

> He uses special lenses attached to suspended video monitors to blur out
> the frame of the image. That technical detail permits one not to see images
> but only people moving. In fact, one forgets the image as an image.[10]

> Hill is much more inventive, especially in the relationships he creates
> between image and spectator. [...] There's no screen or frame around
> it—it's a projection from overhead—just this lit image on an otherwise
> dark wall. [...] it's difficult to treat these figures as merely images.[11]

> [The images] patrol a similar territory to our own. [...] This Pygmalion
> fantasy [...] brings into play the idea that pictures lead a life of their own.[12]

The wraith-like figures are not framed in paintings, elevated on pedestals,
enclosed in television sets, or situated at an insuperable remove. Like phan-
tasmagoric ghosts, the images gather in a dark space shared with spectators.

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6   Robertson, *Mémoires récréatifs*, pp. 1, 278; Morgan, 'Missing Persons', p. 26.
7   Quasha and Stein, 'Tall Acts of Seeing', p. 191. The sentiment is echoed in nearly every review
of the piece.
8   von Eckartshausen, *Aufschlüsse zür Magie*, pp. 129, 131.
9   Cooke, 'Gary Hill', p. 18.
10   Duguet in Balkema and Slager, *Concepts on the Move*, p. 176.
11   Lubbock, 'Is there someone out there?', p. 21.
12   Morgan, 'Missing Persons', pp. 22-23.

Most critics failed to grasp the basic technical operations of Hill's installation.[13] Fewer still discerned the 18th-century precedent. And even the scant links established between *Tall Ships* and the Phantasmagoria are at once too general—'phantasmagoria' is made to stand in for illusion writ large—and too specific, tied solely to this strikingly analogous installation.[14] The technical and historical lacunae are symptomatic of a broader deficiency: neither art history nor film studies recognize phantasmagoria as a fundamental configuration of image and spectator—one with deep media archaeological roots and myriad contemporary manifestations. Focused on individual media, technologies, genres, artists, movements, styles, or subjects, scholars have largely failed to recognize the decisive roles played by the coordinated disposition of these disparate elements in relation to specific modes of spectatorship. Phantasmagoria is one such dispositif.

Two exhibitions. Two hundred years. One set of reactions. One technical setup. In a word, one *dispositif*.[15] Phantasmagoria or, more precisely, the phantasmagoric *dispositive*—the assembly, in a single space and time, of spectators and images (seemingly) freed from material supports—is an essential component of Hill's work and that of countless avant-garde film, video, and sound installations and performances. Robert Whitman's *Shower* (1964), Peter Campus's *Interface* (1972), Anthony McCall's *Line Describing a Cone* (1973), Bill Viola's *The Sleep of Reason* (1988), Gary Hill's *Tall Ships* (1992), and Tony Oursler's *The Influence Machine* (2000) are just a handful of the major and minor works best understood neither as paintings or sculptures nor as cinematic films but rather as phantasmagorias. No less important, we

13   As the above citations make clear, champions and detractors alike misunderstood the basic technical setup. The principal technical point—recognized by the 18th-century commentator but missed by the 20th-century critics—is that the figure be shot (or painted) against a black background; only then can the image be freed from the frame when projected in a dark environment by a hidden device. Hill says as much in Cornwell, 'Gary Hill', p. 225. In terms of the phantasmagoric dispositif, there is no fundamental difference between magic lantern slides and video technology. Indeed, Hill's video should not be considered an 'improvement' in the techno-teleological sense. Phantasmagoric slides were projected in vivid colour and were accompanied by a range of immersive sound effects; Hill's silent images were projected in nebulous black and white.

14   See, for example Hanhardt, 'Between Language and the Moving Image', pp. 115-116; Elwes, *Installation and the Moving Image*, p. 79 but also p.1. The tendency to generalize phantasmagoria as illusion has remained a constant from the 19th century to the present. See, for example, Castle, *Phantasmagoria*, pp. 42-43 and passim. For a take on the Phantasmagoria and its current resonances that is more rigorous media archaeologically even as it is less interested in the finer points of contemporary art, see Grau, 'Remember the Phantasmagoria', pp. 137-161.

15   Within the rapidly expanding literature on *dispositifs*, see Albera and Tortajada, *Cine-Dispositives*.

are witnessing an explosion in phantasmagoric technologies and techniques: immersive 'virtual realities' (which seem finally to have crossed the threshold of viability in devices like the Oculus Rift) and a range of 'augmented realities' (where images are superimposed on our vision of the real world)—above all, a miscellany of attractions and devices erroneously billed as 'holographic'.[16] The worlds of art, cinema, and media are saturated in phantasmagoria. But because phantasmagoria cannot be tied to any one medium or technology, genre or subject, movement or epoch, we have failed to recognize its import.

As a specific attraction, the Phantasmagoria died out in the 19th century. As a commonplace description—'a series of imaginary (and usually fantastic) forms' or 'a shifting and changing scene consisting of many elements, *esp.* one that is startling or extraordinary' (OED)—phantasmagoria suffuses the world.[17] What concerns us, however, is not any old razzle-dazzle, fantasy, or gore. Phantasmagoria is not just a subject or effect, much less an amusement confined to centuries past. Phantasmagoria is above all an operation: the actual (or apparent) gathering of humans and images through an assortment of techniques that for centuries have pervaded the worlds of art and cinema, theatre and spectacle. And yet we lack the critical terminology to describe the co-presence of images: not distant visions (like those proffered in the cinema) nor circumscribed pictures (like those enclosed in frames or television sets) but rather images that appear to abandon their material supports and enter our world. This essay aims to establish phantasmagoria as the precise term to describe an assembly of bodies and images in a shared time and space. The first two sections locate phantasmagoria in relation to art, film, and their respective corpuses of criticism and theory. The third section situates phantasmagoria alongside two related dispositifs: the cinematic (images set at a distance) and the domestic (images enclosed in objects). The fourth section identifies the salient qualities of phantasmagoria in relation to corporeality, space, and time. The final section returns to the motley artists and works named above and reveals their profound and multifaceted alignment toward phantasmagoria. At every turn, the essay demonstrates the importance of dispositifs—not only their subtle variations but also and above all their stark and enduring differences. Dispositifs alone may not determine our relationship to images, but their configurations of time and space, bodies and vision are decisive aspects of every work of art and every encounter with media.

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16   On the technical and historical aspects of holography, see Schroeter, *3D*. On the cultural politics of 'holography', see de Bruyn, 'Empire's Hologram'; and 'Das Holografische Fenster', pp. 67-98.

17   Overviews abound. See, for example, Nead, *The Haunted Gallery*; Warner, *Phantasmagoria*.

Art Installations: Beyond Illusion and Anti-Illusion

In the winter of 1798-1799, Étienne-Gaspard Robertson famously installed his Phantasmagoria in a Capuchin convent depopulated by the French Revolution. Yet this was hardly the first time that images were brought to life in sacred spaces. For centuries, as Giovanni Careri asserts, Baroque chapels were 'populated by bodies made of paint, marble, stucco, and flesh'.[18] In the hands of Gian Lorenzo Bernini, the effects were positively phantasmagoric. No less an authority than Rudolf Wittkower states (and restates) as much in his seminal monograph, which warrants quotation at length. The Cornaro Chapel, centred around but not limited to *The Ecstasy of Saint Teresa* (1647-1652), instantiated the phantasmagoric confusion of reality and illusion like few works, prior or since.

> Bernini made this scene real and visionary at the same time. [...] The vision takes place in an imaginary realm on a large cloud magically suspended in mid-air. [...] the group is bathed in warm and mysterious light, falling from above through a window of yellow glass hidden behind the pediment and playing on the highly polished marble surface of the two figures. [Cornaro family members flank the epiphany in trompe l'oeil boxes such that] the fictitious architecture and the architecture of the real chapel seem to interpenetrate. This creates the illusion that the Cornaro family is sitting in an extension of the space in which we move. [...] Like the Cornaro family, the worshipper participates in the supra-human mystery shown on the altar, and if he yields entirely to the ingenious and elaborate directives given by the artist, he will step beyond the narrow limits of his own existence and be entranced with the casuality of an enchanted world.[19]

Coloured and white marble, yellow glass and warm light, painted mural and stucco, gilded wood and gilt bronze—to reduce the work to 'sculpture' is to miss the mark. What's more, mysterious lighting from hidden sources, fictitious architectures, hyper-realism: these are the building blocks of phantasmagoria. In the Altieri, Fonseca, and Cornaro Chapels, Wittkower concludes, 'Bernini created a supra-real world in which the transitions seem obliterated between real and imaginary space, past and present,

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18   Careri, *Bernini*, p. 1.
19   Wittkower, *Bernini*, p. 158.

phenomenal and actual existence, life and death.'[20] One can hardly define phantasmagoria more succinctly.

The power of Bernini notwithstanding, the marginalization of phantasmagoria in avant-garde discourse is no accident. For the last fifty years, avant-garde art and film criticism has been mired in a series of binaries inherited from a particularly potent blend of 1970s theory. Some combination of Minimalism's emphasis on phenomenology, post-Minimalism's exploration of process and institutional critique, and apparatus film theory's constitution of a cinematic subject has divided the world into good and bad objects: materiality and immateriality; embodiment and disembodiment; active participation and passive spectatorship; real space and illusionistic space; more broadly, reality and illusion; demystification and mystification; avant-garde art and Hollywood film.[21] Even as the dominant movements of the 1960 and '70s abandoned strict divisions between media, adopted projections and moving images, and foregrounded the physical presence of viewers, they did so overwhelmingly in opposition to illusions of any kind.[22] In such discourses and practices, illusion is a four letter word; phantasmagoria is out of the question.

Critics have perpetuated the elision of perceptual illusion and ideological mystification by adhering to the derogatory omnibus 'phantasmagoria'. For Marxist critics in the mould of Theodor Adorno, phantasmagoria was and is tied to the occultation of production under capitalism and, as exemplified in the work of Richard Wagner, asserts 'the concept of illusions as the absolute reality of the unreal'.[23] In such an intellectual climate, installation art—above all, film and video installations—could only be

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20   Ibid., p. 159.

21   See Mondloch, 'Screens'; Rodowick, *The Crisis of Political Modernism*.

22   Consider, for example, the opening sentences of Peter Gidal's 'Theory and Definition of Structural/Materialist Film' (1976): 'Structural/Materialist film attempts to be non-illusionist. The process of the film's making deals with devices that result in demystification or attempted demystification of the film process.' Gidal, 'Theory and Definition', p. 1. Compare Andrew Uroskie's recent and striking analysis of Janet Cardiff and George Bures Miller's *The Paradise Institute* (2001): 'If the apparatus is foregrounded, it is not for the purpose of dismissing illusion and maintaining a contravening reality, but rather so as to throw our demarcation of reality and illusion into doubt.' Uroskie, *Between the Black Box and the White Cube*, p. 3.

23   Adorno, *In Search of Wagner*, pp. 85-96, here p. 90. Noteworthy among numerous recent attacks waged against artworks deemed too phantasmagoric is T.J. Clark's invocation of Benjamin to conclude his assault on Tony Oursler's *The Influence Machine:* 'Modernity, as Benjamin reminds us, has thrived from the very beginning on a cheap spectacle of the strange, the new, the phantasmagoric. But modernity also truly dreams. The art that survives is the art that lays hold of the primary process, not the surface image-flow.' Clark, 'Modernism, Postmodernism, and Steam', p. 173. Several Benjamin scholars, to the contrary, have identified in his thought

trumpeted under the banner of 'anti-illusion'.[24] Yet the media archaeology of scholars like John Tresch and Tom Gunning demonstrates definitively that phantasmagoria cannot be reduced to a derogatory omnibus for cheap and illusory spectacles.[25] Even as they define 'phantasmagoria' differently, Tresch, Gunning, and other scholars have laid the necessary groundwork for a renewed encounter with the concept of phantasmagoria stripped of its pejorative connotations. Indeed, it may very well be the pejorative designation that has blinded critics and historians to a crucial quality of so much recent art and media, a quality we can name—without judgment and with renewed media archaeological vigor—phantasmagoria: the assembly of humans and images.

Cinematic Faith: Insufficient and Excessive

The negative associations conjured by the term phantasmagoria have hindered its critical evaluation by scholars of avant-garde art and film. Its neglect has been compounded by the existential debates within cinema and media studies over the specificity or singularity of film.[26] For phantasmagoria—whether that of Bernini, Robertson, or Hill—invariably evokes an expansive history of cinema and undercuts efforts to delimit the specificity of film. The battle often hinges on the status of the cinematic *dispositif.* Once the centrepiece of so-called apparatus theory, cinemas are now cast aside with abandon or fanatically conserved.[27] We will address each position in turn. In 2006, philosopher Giorgio Agamben theorized the cell phone as a dispositif, a techno-political apparatus that was reconfiguring the human subject.[28] Agamben's breezy analysis was at once too quick to ascribe major

the centrality of 'critical' or 'progressive' phantasmagorias. See Cohen, 'Walter Benjamin's Phantasmagoria', pp. 87-107; Jennings, 'On the Banks of a New Lethe', p. 104.

24   Consider the works gathered in the aptly named 'Anti-Illusion' exhibition at the Whitney Museum in 1969: paintings, sculptures, installations, compositions, and performances by Carl Andre, Robert Ryman, Eva Hesse, Steve Reich, Michael Snow, and others. Here, the co-presence of viewer and image aimed at the 'reversal of illusion' and 'inverse trompe l'oeil'. Monte, 'Anti-Illusion', p. 7 and passim.

25   Tresch insist on 'the displacement, if not dissolution, of the line separating scientific truth from collective phantasmagoria', just as Gunning triangulates the dyad of enlightenment and mystification through the category of wonder. See Tresch, 'The Prophet and the Pendulum', p. 36; Gunning, 'Phantasmagoria and the Manufacturing of Illusions and Wonder', pp. 31-44.

26   See, for example, Andrew, *What Cinema Is!.*

27   See esp. Baudry, 'The Apparatus', pp. 299-318.

28   Agamben, *What is an Apparatus?.*

subject effects to a single apparatus and too slow to identify the radical transformations in mobile devices already underway. Concurrently, *New Yorker* film critic David Denby reported from the front lines of the media-industrial complex, which recognized in the video iPod, 'a new platform for movies, a new convenience that will annihilate old paradigms'.[29] Now that smartphone and tablet users number in the billions and multi-platform video technology has become as hegemonic as cinemas were in their heyday, the 'new convenience' has assumed the status of a dispositif. In Denby's account, the most damning news was an evaluation not of media technologies but of media subjects: a new generation of cinema spectators or, more precisely, media consumers. 'According to home-entertainment specialists I spoke to in Hollywood', Denby writes, 'many kids are "platform agnostic"—that is, they will look at movies on any screen at all, large or small'.[30] Let's dwell for a moment on the phrase 'platform agnostic'. For if Denby's target was a generation of viewers—'kids'—he borrowed the term from computing. According to the OED, a *platform* is 'a standard system architecture; a (type of) machine and/or operating system, regarded as the base on which software applications are run'. Adobe Acrobat and Firefox, to cite two among innumerable examples, are *platform agnostic* in so much as they can run on any computer platform, be it MS Windows, Apple OS, Linux, what have you. The term migrated from computer platforms to much wider-ranging media platforms and their consumers: cinema, television, desktops, laptops, tablets, smartphones are all equally valid platforms for the consumption of sounds and images by *platform agnostics*. Industry executives understood viewers—human beings—in terms of software and devices. Today, one is hard pressed to find a commercial campaign—let alone a movie—that is not cross-platform, that is, whose 'content' is not 'platform agnostic'.[31] Platform agnosticism – the capacity to deliver and consume media content across multiple platforms – became the creed of software engineers, advertisers, politicians, organizers, and corporate and media gurus.

The backlash against platform agnosticism came swiftly. Companies are encouraged by some to focus on their core platforms and, much more relevant to us, film and art theorists are evangelizing, with renewed vigor, essentialist strains of specificity and materiality—a willful blindness to the

29   Denby, 'Big Pictures', p. 54.
30   Ibid.
31   Artists have followed suit. Stan Douglas, for example, recently premiered a new multimedia theatre work, *Helen Lawrence* (2014), which was preceded earlier that year by *Circa 1948*, a 3D-augmented reality app available for iOS devices. (Presumably only funding limitations impeded an Android OS version; accordingly the app is not truly platform agnostic.)

epochal change unfolding around us. Cinema studies or art history, we are often told, must be saved from the perdition of media and visual studies. Celluloid, others preach, must not only be preserved but upheld against video and digital pretenders. A third claim pertains to the location, place, site, or, more expansively yet more precisely, the *dispositif* of cinema. Among the most passionate spokesmen for the essential primacy of the cinematic dispositif is film theorist Raymond Bellour:

> I begin from a simple hypothesis, but one involving infinite detours: *the lived, more or less collective experience of a film projected in a cinema, in the dark, according to an unalterably precise screening procedure, remains the condition for a special memory experience, one from which every other viewing situation more or less departs.* This supposes a certain rule of faith of which the spectator would be the incarnation, in the unfolding of a liturgy associated with film, with cinema, and with film in the cinema situation.[32]

Bellour counters platform agnosticism with an article of cinematic faith, a liturgy of film, a hypothesis with infinite detours, all of which, however, follow the same orthodoxy. The failure of this orthodoxy is not its insistence on the specificity of the cinematic dispositif but the pronouncement of its timeless primacy, the condition *'from which every other viewing situation more or less departs'*. Where platform agnostics are willfully ignorant of dispositifs and reduce cinema—and other media—to mere 'content', platform zealots are willfully ignorant of the historical contingency of movie theatres and hypostatize classical theatrical cinema into a medium-specific essence.

But, as Jonathan Crary has recently noted, cinema as a dispositif was relatively fixed only from the late 1920s through the 1960s and television

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32   Bellour, 'The Cinema Spectator', p. 9. He later argues that 'The only inviolate element is the *dispositif*. The theatre. The darkness. The fixed time of the screening [...]' (p. 14). Bellour's account is informed and nuanced; but it ultimately hinges on the unresolved contradiction whereby 'the dispositif of cinema is historical, it is also transhistorical'. Bellour, 'La querelle des dispositifs', p. 18. In the Foreword to the recent English translation of *L'entre-images*, Bellour spells out his about-face in regard to specificity—where he earlier tore down divisions between theatrical cinema and installation art, he now asserts the specificity of the cinematic dispositif. In Bellour, *Between-the-Images*, p. 11. Francesco Casetti has also explored the phenomenon extensively. As his preferred term—'relocated cinema'—attests, Casetti also anchors the experience of film in the cinema. But Casetti aims not at retaining theatres as the primary site of cinematic reception but rather at theorizing the cinema to come. See Casetti, 'Elsewhere', pp. 348-351; Casetti, 'Cinema Lost and Found'; Casetti, 'Back to the Motherland', pp. 1-12; Casetti, *The Lumière Galaxy*, pp. 17-42.

in the US only from the 1950s into the 1970s. The perceived permanence of certain key features, he argues, 'allowed critics to expound theories of cinema, television, or video based on the assumption that these forms or systems had certain essential self-defining characteristics. In retrospect, what were most often identified as essential were temporary elements of larger constellations whose rates of change were variable and unpredictable.'[33] Our charge as historians and theorists is to recover and conceptualize the stark variables and unexpected continuities in these larger media constellations, a task wholly abandoned by platform agnostics and platform zealots alike. Both zealots and agnostics render history and politics irrelevant: the first group does so by universalizing the cinematic condition into religion, the other by annulling it into content. Our charge, finally, is not to find the essence of cinema or delimit its specificity but rather to conceptualize its multiplicity. In its long history—what is often described as its pre- and post-history—cinema has always engendered a multiplicity of sites and a multiplicity of images. Cinemas and film simply constituted the dominant iteration in the medium's classical period. But cinema is no more tied to movie theatres and celluloid than sculpture is bound to temples and marble. In a word, cinema will be multiple or it will not be at all.

Cinematic. Domestic. Phantasmagoric.

The multiplicity revolves around dispositifs in which moving images have thrived, to varying degrees, over the last few centuries. This typology advances from the media archaeological observation that certain types of images thrive best in certain types of locations—and not in others. For the sake of simplicity, consider a three-fold multiplicity: three media dispositifs that promote and inhibit specific types of images in specific types of locations. Each dispositif is internally multifaceted and externally porous to other dispositifs. Claims to their coherence and strict delineation are heuristic. But violations of these boundaries have real consequences: aesthetic, social, economic, perhaps even political. We will distinguish the three dispositifs as the cinematic, the domestic, and the phantasmagoric.

The cinematic is an emblematic instance of what Joachim Paech has described as the experience of proximity effected through distance.[34]

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33   Crary, *24/7*, p. 38.
34   Paech, 'Eine Dame verschwindet', especially p. 777. Some of the media archaeology in this section builds on research developed in my book, *Artificial Darkness*.

Cinema *places* us *in* the film by *displacing* us *from* the auditorium. As
an architecture, system, or dispositif that effects proximity through
distance, the cinematic arose wholly independent of film. (Conversely,
in their first decade, like today, movies were not inextricably bound
to purpose-built theatres.) Radical spatial dislocation and separation
constituted one of the core qualities of 19th-century attractions. Barker's
Panorama, Daguerre's Diorama, the Kaiserpanorama, the Kinetoscope,
the cinema of Edison or the Lumières, and, above all, Wagner's theatre
at Bayreuth produced, as Crary argues, 'the image as an autonomous
luminous screen of attraction, whose apparitional appeal is an effect of
both its uncertain spatial location and its detachment from a broader
visual field'.[35] Among these attractions, Wagner's theatre at Bayreuth was
exemplary on two separate counts. First, it was universal. The Panorama,
Diorama, Kaiserpanorama, and Kinetoscope were proprietary structures
built for the exhibition of specific image types. (Note the frequent proper
nouns and patents.) The Kaiserpanorama, a late 19th-century device that
enabled up to 25 individuals to view a series of stereoscopic images, could
not display Panoramic paintings, which measured thousands of square
feet, any more than a Diorama could exhibit the 35mm filmstrips that ran
through the Kinetoscope, Edison's early cinematic peepshow device. The
exhibition structures required specific technical images, and the images
required specific technical exhibition structures. Wagner's Festspielhaus,
by contrast, was a model theatre that could accommodate countless types
of performances and images. Indeed, its most significant legacy was its
adoption by cinemas, that is, as a support for a medium as yet unrealized
in 1876.

Second, Wagner theorized spectatorial displacement more radically
than any other 19th-century figure. His essay 'The Art-Work of the Future'
became the touchstone, directly and indirectly, for countless 20th-century
theories of cinema:

> In the arrangement of the space for the spectators the need for optical and
> acoustic understanding of the artwork will give the necessary law [...].
> Thus the spectator transplants himself upon the stage, by means of all his
> visual and aural faculties; while the performer becomes an artist only by
> complete absorption into the public. [...] the public, that representative
> of daily life, disappears from the auditorium completely, and lives and

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35   Crary, 'Géricault, the Panorama, and Sites of Reality', p. 19.

breathes now only in the artwork which seems to it as Life itself, and on
the stage which seems the wide expanse of the whole World.[36]

Wagner's turn-of-the-century translator, William Ashton Ellis, could not
equal the Master's temerity and wrote that the public 'forgets the confines
of the auditorium' rather than 'disappears' from the auditorium. But viewed
retrospectively from the rise of cinemas, disappearance was not too strong
a word. Proximity effected through distance is the hallmark of cinema as a
dispositif. Cinematic immersion necessitates the *displacement* of spectators
from their environment.

    'Consider, on the other hand, the opposite experience, the experience
of TV, which also shows films: nothing, no fascination; the darkness is
dissolved, the anonymity repressed, the space is familiar, organized (by
furniture and familiar objects), tamed.'[37] Thus Roland Barthes compared
cinema and television—the signature media for the cinematic and domestic
dispositifs. The domestic implies not only the home but also, as betrayed by
its French etymology, a household servant. Whether at home, at work, or on
the move, we are pampered and besieged by devices that ring and vibrate,
speak and listen, take and stream and play videos; they know where we are
and remind us what to do and respond to our commands; they facilitate
and carry out our virtual work, survey nearly every facet of our lives, and
perform innumerable other tasks once carried out by domestics.[38] Domestic
media devices thus most readily earn their name in the present. But they
reach back to the 19th-century salon, which harboured not only paintings
and prints but also phenakistoscopes, praxinoscopes, and other optical
toys. The domestic is also the middle class living room where television
made its home, first as furniture, later as hearth. Domestic are the tract
houses, apartment complexes, and McMansions littered with computers,
tablets, phones, and other devices for the consumption of media content, not
least—though quite nearly least—movies. Domestic are the ever increasing
number of galleries from the 1960s to the present in which altered television
sets by Nam June Paik, ornate celluloid loops by Simon Starling, and the
cinematic and videographic sculptures of countless others found quarters
and, eventually, buyers, who bring the works home. In the domestic, cinema

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36   Wagner, 'The Art-Work of the Future', p. 185; Wagner, *Das Kunstwerk der Zukunft*, pp. 188-189.
Translation modified. The pertinent original German reads: 'aus dem Zuschauerraume aber
verschwindet das Publikum, dieser Repräsant des öffentlichen Lebens, sich selbst'.
37   Barthes, 'Upon Leaving the Movie Theatre', p. 2.
38   On service and servants, see Krajewski, 'The Power of Small Gestures', pp. 94-109.

is an optical toy, a piece of furniture, a book, a sculpture—in a word, an object. Accordingly, it is *placed* among other objects. Crucial is that devices like televisions do not create the same sense of placelessness as cinema. As Anna McCarthy argues: 'the idea that the television apparatus is itself an encroaching force of placelessness is a flawed, dangerously fetishistic one. The language of placelessness makes us forget that television is an object and, like all objects, it shapes its immediate space through its material form.'[39] What's more, domestic 'cinema' is an object that, like nearly all capitalist objects, is made to be bought and sold. The domestic houses commodities. In the domestic, cinema finds a *place* as a commodity. Its vernacular forms range from toys to televisions and other electronic or digital gadgets; its culturally exalted forms we call artworks.

Like the cinematic and the domestic, the phantasmagoric is neither medium-specific nor platform agnostic. Unlike cinema and television, phantasmagoria never attained a classical form or a normative discourse. Indeed, the phantasmagoric dispositif emerges uncomfortably alongside the cinematic and the domestic.[40] It is less familiar, but by no means less important, to contemporary spectators and viewers. So what is the phantasmagoric? Let's begin with what it was. Coined at the end of the 18th century, the Phantasmagoria, as its name announced, assembled ghosts. Whether assuming the shape of a bloody nun, Medusa, the devil, or that of recently deceased leaders like Louis XVI or Robespierre, these ghosts were first and foremost mediated images. Phantasmagoric images were projected onto visible smoke or invisible screens suspended in dark spaces; they were unmoored from their material supports and occupied the same dark space as spectators. The original phantasmagorias were developed by enlightened showmen and duplicitous necromancers like Johann Schröpfer, Paul Philidor, and, most famously, Étienne-Gaspard Robertson. Their most

39   McCarthy, 'From Screen to Site', p. 96.

40   The museum director's introduction to *Projected Images*, an unheralded but important 1974 exhibition at the Walker Art Centre, frames the term 'projected images' in a manner similar to the phantasmagoric, that is, as a third term outside the cinematic and the domestic: 'While filmmaking and video production attract an increasing number of artists, most of these converts observe the technical conventions of the new media; their films are intended for viewing under standard projection conditions [= the cinematic] and their videotapes are made to be seen on television monitors [= the domestic]. By contrast the artists represented in this exhibition conceive of film and video images essentially in environmental terms—as dominant elements of interior spaces—and they are as much concerned with the changing spatial and psychological relationships between observer and image as with the character of the image itself.' Friedman, 'The Floating Picture Plane', p. 6. The exhibition featured works by Peter Campus, Robert Whitman, and other artists with strong affinities to the phantasmagoric.

important descendant was the mid-19th-century attraction named Pepper's Ghost, after the rational entertainer John Henry Pepper, a longtime lecturer and honorary director of London's Royal Polytechnic Institution. John Henry Pepper reaped a fortune from the Ghost, but he invented none of the elements in the device that would eventually bear his name.

The Ghost's seminal features were invented by Henry Dircks. And they derived, as suggested by Dircks's preferred designation—the 'Dircksian Phantasmagoria'—from the Phantasmagoria. To be all too brief, Pepper's Ghost or the 'Dircksian Phantasmagoria' comprised a giant, slanted pane of glass placed on stage such that an unawares audience could peer *through* the glass to the action on stage and simultaneously see a reflection *in* the glass of an actor in the wings (or below). Pepper's Ghost was briefly fused with film in attractions such as Oskar Messter's Alabastra, patented in 1910, variants of which were known as Kinoplastikon and Tanagra. The technique is the basis for nearly all the recent applications erroneously dubbed holographic: 'augmented reality' spectacles (eyewear) like Microsoft's HoloLens and Google Glass as well as mass spectacles for live and mediated audiences such as a 2012 Coachella concert that featured Tupac Shakur—who was murdered in 1996 but nonetheless 'appeared' onstage with Snoop Dogg, Dr. Dre, and other flesh-and-blood stars—and the 2014 resurrection of Michael Jackson at the Billboard Music Awards, where he performed a new song, 'live' on stage.[41] Over the course of 220 years, we have exchanged Robespierre and the Revolution for Tupac and hip hop, the slayer of kings for the King of Pop, but the techno-spatial configuration of phantasmagoria—that is, the phantasmagoric dispositif—has remained surprisingly stable.

In phantasmagorias, there is no radical separation between media images and human bodies; that, as we know, is the domain of the cinematic. Nor are the images contained within objects, as in the domestic. In the original 18th-century phantasmagorias and their contemporary descendants, humans and images are assembled in a common space and time. Whether these humans are credulous dupes or highly trained actors is of little consequence. Phantasmagorias are highly efficacious. We need not believe in ghosts to perceive phantasmagoric images. But phantasmagorias are also highly precarious. Here, cinema is strategically *emplaced*, like a weapon, to be deployed with unerring precision or risk exposure and failure. Phantasmagoria is a matter of performance or, more broadly, theatre, where living beings and mediated images can assemble.

41   More recently, a 'holographic' performance by the Chicago rapper Chief Keef was shut down by police. See Coscarelli, 'Hologram Performance'.

Bodies, Spaces, Times

Displacement. Placement. Emplacement. But not re-placement. Cinema is not replaced by phantasmagoria, it is emplaced therein. Nor is it replaced by television or tablets; it is placed in domestic devices and spaces. As this porosity or fluidity attests, the divisions between displacement, placement, and emplacement are not quite as neat as this terminological triumvirate might suggest. And yet each dispositif gravitates toward specific and interlocked configurations of embodiment, space, and time.

The cinematic negates spectatorial space, the better to allow images to work on spectators. The domestic consents to space, the better to preserve the objects, which house the images. The phantasmagoric reconfigures extant space, the better to fuse objects, spectators, and images. In the cinema, we tend to forget not only the surrounding space but also our bodies. With Wagner, we remember, 'the public, that representative of daily life, disappears from the auditorium completely'. Exceptional genres—pornography, say, or horror—that engage our bodies directly are just that: exceptions that tend toward the phantasmagoric.[42] Where bodily awareness is exceptional in the cinema, a cinematic sense of disembodiment is less likely on a couch before a TV set, with a smartphone or phenakistoscope in your hand, or in a brightly or even dimly lit art gallery. As Peter Campus noted in 1974: 'The monitor is an object sitting rigidly in space. [...] Compare this to a movie theatre where every effort is made to erase one's ability to locate the screen in the viewer's space.'[43] If the cinema, according to 1920s film theorist Rudolf Harms, should 'guarantee the highest degree of bodily detachedness and seek to alleviate the shortcomings of the individual's fixed and local bondedness', then domestic spaces welcome couch potatoes, gallery-goers, and other forms of quotidian and bathetic embodiment.[44] (Why ever these forms of mundane embodiment were aligned with corporeal plenitude in the reception of Minimalism and related art movements will be a matter for future art historians to disentangle.) It is phantasmagoria, once again, that poses the least familiar and most unsettling form of spatiality and embodiment among the dispositifs in question. Here we are often hyperaware of our

42   Symptomatically, the first breakout 3D film, *House of Wax* (1953), was nothing if not a tale about phantasmagoria rendered quasi-phantasmagorically—that is, a tale about the confusion of humans and images rendered through the extension of images into spectatorial space. On the 'excessive mimesis' in *House of Wax*, see Siegert, 'Die Leiche in der Wachsfigur, especially', pp. 151-154.

43   Campus, 'Video as a Function of Reality', p. 82.

44   Harms, 'Philosophie des Films', p. 60.

bodies and surroundings. In a reversal of the cinematic, the phantasmagoric must guarantee the highest degree of image detachedness—that is, it must unmoor images from any material support, including screens—in order to enhance their local bondedness. The phantasmagoric image, in other words, cannot be perceived as trapped inside a device or on a screen, nor as absolutely separated from the space we inhabit; rather, the phantasmagoric image must occupy the same space we occupy.

Each dispositif also requires and engenders a specific temporality. The cinematic is most effective as fixed duration or 'feature length'. We are willing to forget our bodies and our surroundings—but not indefinitely. As Andy Warhol noted in relation to his early, long-duration films like *Empire* (1964): 'My first films using the stationary object were also made to help the audiences get more acquainted with themselves.[45] Conversely, in order to turn cinema into an object, it is essential that duration be evacuated to the greatest possible degree. The duration of the image becomes a property of the objects. The results—familiar from living rooms and art galleries—are open-ended flow and short loops. The former is epitomized in closed-circuit feeds or continuous television programming.[46] The latter is evident in devices such as phenakistoscopes and zoopraxiscopes as well as GIFs and other image formats. Video artists from the 1970s to the present have employed and problematized both techniques: the close-circuit camera aimed at a Buddha statue in Nam June Paik's *TV-Buddha* (1974), the feverish loops in Dara Birnbaum's *Technology/Transformation: Wonder Woman* (1978-1979), or the confounding loops in Stan Douglas' *Inconsolable Memories* (2005), which disturb the 'this is where we came in' relationship to film and video installations (and recall an earlier moment of cinematic spectatorship, where entrances and exits were less policed). Lastly, the temporality of phantasmagoria is real time. Phantasmagorias may call up the dead or predict the future, as Thomas Elsaesser has observed, but for the spectator, 'the senses are anchored and the body situated in a "here and now"'.[47] Real time, of course, means more than the here and now. And the recent rise of phantasmagoria cannot be divorced from the ascendance of video, computers, and other real-time imaging systems. In Paul Virilio's sweeping account, the image has obeyed several fundamental logics or logistics in

45   Warhol in Gidal, *Andy Warhol*, pp. 92-94.
46   In Raymond Williams' famous formulation: planned flow is 'perhaps the defining characteristic of broadcasting, simultaneously as a technology and as a cultural form'. Williams, *Television,* p. 86.
47   Elsaesser, 'Between Knowing and Believing', p. 70.

the last centuries: the *formal* logic of painting, engraving, and architecture, which ended in the 18th century; the *dialectical* logic of photography and film of the 19th and early 20th centuries; and the *paradoxical* logic of video recording, holography, and computer graphics, beginning after the Second World War. Under the current reign of *paradoxical presence*: 'the real-time image dominates the thing represented, real time subsequently prevailing over real space, virtuality dominating actuality and turning the very concept of reality on its head'.[48] What remained exceptional in Bernini's Cornaro chapel and Robertson's Capuchin convent is now a generalized condition. Revelers at Coachella and wearers of HoloLens—like visitors to Bernini's *Saint Theresa*, Robertson's Phantasmagoria, and Hill's *Tall Ships*—experience media images and real bodies, their own and those in trompe l'oeil boxes and on real stages, as part of a shared space-time continuum. Paradoxical presence inheres in the longue durée of phantasmagoria; but the post-WWII explosion of paradoxical presence may conversely explain the recent rise of the phantasmagoric: no longer a series of isolated attractions but a fundamental—perhaps *the* fundamental—image logic of our time. When real time prevails over real space, real space becomes phantasmagoric, an assembly of bodies and images.[49]

Three Pathways into the Phantasmagoric

The phantasmagoric dispositif has been foundational for art, film, video, and theatre since the 1960s. But because it often crossed the boundaries of established media or art forms like painting, film, or theatre, it has remained largely hidden in the historical record. Three exchanges are especially pronounced. The first is the expansion of cinema into performance, sculpture, or installation, as evident in Expanded Cinema and exemplified in the Solid Light films of Anthony McCall. The second is the introduction of film and video into sculpture and theatre, as perfected in the 'Cinema Pieces' and 'Theatre Works' of Robert Whitman. And finally, there is the phantasmagoric in video installations, like those of Bill Viola or Peter Campus. We will address each phantasmagoric practice in turn.

48   Virilio, *The Vision Machine*, p. 63.
49   Campus encapsulated this logistical reversal to conclude his 1974 statement: 'In a closed-circuit video situation one is no longer dealing with images of a temporally finite nature. The duration of the image becomes a property of the room.' Campus, 'Video as a Function of Reality', p. 83.
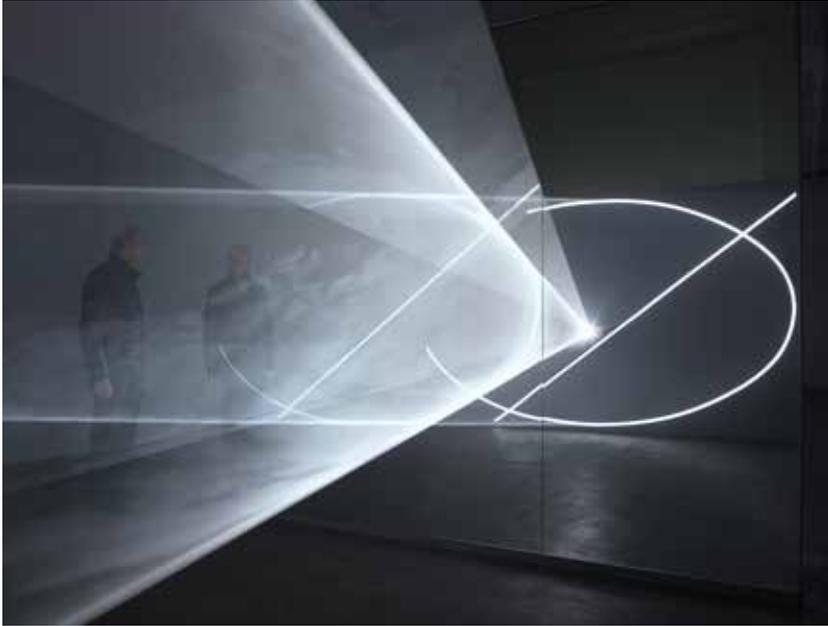
23. Anthony McCall. *Split Second (Mirror),* 2018. Installation view, Sean Kelly Gallery, New York. ©
Anthony McCall. Photo: Dan Bradica. Courtesy of the artist.

Beginning with his now-canonical *Line Describing a Cone* (1973), Anthony
McCall's Solid Light films comprise the projection of two-dimensional
geometric forms through a misty and darkened space such that the beam
of light is perceptible as a three-dimensional, immaterial sculpture.

McCall himself has situated his practice at the intersection of film,
sculpture, and drawing. Recent critics have framed his work as a 'radical
co-articulation of film *and* sculpture, as Gilles Deleuze might have put it,
rather than a dialectical development leading from sculpture into film'.[50]
In the immediate context of Expanded Cinema and post-Minimalism, a
radical co-articulation of film and sculpture was not only aesthetically
but also politically ambitious in terms of its assault on traditional cinema
spectatorship. In McCall's decisive 1974 statement: 'It is the first film to
exist solely in real, three-dimensional space. [...] It refers to nothing beyond
this real time.' He parried spectatorial immobility with a '[viewer who]
can, indeed needs to, move around relative to the slowly emerging light
form'. What's more: 'The viewer watches the film by standing with his or

50   Baker, 'Film Beyond its Limits', p. 104.

her back toward what would normally be the screen.'[51] According to these searing statements, McCall's solid light films negated core aspects of the cinematic apparatus. That is, they were understood in largely negative terms. But in the longer history of dispositifs, the Solid Light films were and remain unambiguously phantasmagoric: projections on smoke in darkened spaces that assemble humans and images. As Gunnar Schmidt argues, McCall's *Line Describing a Cone* is 'a new combination of modern abstraction and premodern theatricality'.[52] Two hundred years and a host of social, political, epistemological, and aesthetic ruptures separate the original Phantasmagorias from *Line Describing a Cone* and other Solid Light films, including a range of recent digital works projected vertically down from the ceiling. But the configuration of images and bodies, the common space-time continuum, and the experience of an immediate mediation (or paradoxical presence) belong neither to cinematic film nor to domestic sculptures, nor even to their co-articulation, so much as it adheres to the dicta established by the Phantasmagoria over two hundred years ago. The establishment of techno-aesthetic precedent does not diminish the radicality of the work. Quite the contrary. In light of the phantasmagoric dispositif, we can recognize in the work of McCall and others not only a reactive, negative relation to traditional artistic mediums like film and sculpture but also a positive engagement with the struggles of contemporary mediated existence. For what was a minor attraction two hundred years ago has become a generalized dispositif in our time.

Loosely affiliated with Happenings, Fluxus, and Expanded Cinema, the work of Robert Whitman plots a second trajectory into the phantasmagoric. Whitman's encounter with phantasmagoria proceeded from the opposite direction as McCall's, namely through the introduction of cinema into sculpture and theatre. Whitman's cinematic installations, or, as he called them, Cinema Pieces, are now among the best known and most striking phantasmagoric works from the 1960s. In *Window* (1963), *Dining Room Table* (1963), and *Shower* (c. 1964), Whitman fuses real objects and projected images to confuse, at least temporarily, reality and illusion. In *Shower*, to cite the locus classicus of phantasmagoric sculpture, a film of a woman showering

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51 McCall, 'Two Statements', pp. 250-251. In 2003, when McCall republished the statement in *October*, he did not soften the stance so much as introduce room for productive confusion. No longer did the film exist *solely* in real, three-dimensional, space. No longer was it necessary to contrast his solid light film with films that 'allude to a past time'. With thirty years' hindsight, *Line Describing a Cone* at least hinted at the possibility of other times and places. Mediation crept into the work's primal immediacy. See McCall, 'Line Describing a Cone', pp. 42-62.

52 Schmidt, *Weiche Displays*, p. 27.

is projected inside an operating shower, enclosed by a shower curtain and built into a wall in a dark space. The film is back projected—like the original Phantasmagoria—such that the projector is doubly screened off from the viewer: first by the translucent screen, second by the translucent shower curtain. Whitman effects a collapse of illusion and reality as the composite image received by the viewer is produced by virtual images projected on the first screen and drops of real water projected on the second. The famous and widely disseminated photograph of *Shower* maximizes its trompe l'oeil impact. But in short order, the looped film belies the illusion. Shots of the full-length nude are replaced by close-ups of body parts, mist, and the shower head, which sprays water first and then dark paint. As we return to the full-length nude, now dripping in paint and redolent of the Abstract Expressionist techniques still very much in vogue, we have crossed the boundaries of sculpture, cinema, and painting. More precisely, we have witnessed the Berniniesque, phantasmagoric mobilization of multiple media to fuse images and bodies in one and the same space and time.

Whitman's case should be an obvious one. His work has long been identi-fied with 'a complete mesh of illusion and reality' (Richard Kostelanetz)[53] and 'actual [*sic*] holographic images of oneself floating in three-dimensional space in real time' (Gene Youngblood).[54] More recently, curators like Lynne Cooke and scholars like Branden Joseph and Andrew Uroskie have labeled Whitman's work 'phantasmagoric' or 'phantasmal', though not necessarily in the media archaeological sense advanced here.[55] And yet critics invari-ably assign competing media to various elements within a given work—'a complex interplay of the sculptural, the pictorial, and the filmic'[56]—when the varied media and techniques are better understood as a coordinated manifestation of the phantasmagoric.

Such is certainly the case in Whitman's performance pieces or, in his preferred terminology, Theatre Works, most illustriously *Prune Flat* (1965), a work that refuses categorization as cinema or theatre, painting or sculpture.

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53   Kostelanetz, *The Theatre of Mixed Means*, p. 229. But note the context in the conversation with Whitman:
Kostelanetz: 'When the image flashed off the audience gasped. I thought this was a marvelous sign of the effectiveness of your deception, but it never happened again—such a complete mesh of illusion and reality. Wouldn't this be worth attempting to realize every night?'
Whitman: 'I think that is nice, but it isn't crucial. I don't think that's what the piece is about.'
54   Youngblood, *Expanded Cinema*, p. 416.
55   Cooke, 'Through a Glass, Darkly', p. 64 and passim; Joseph, 'Plastic Empathy', p. 74 and passim; Uroskie, *Between the Black Box and the White Cube*, p. 141 and passim.
56   Cooke, 'Through a Glass, Darkly', p. 66.

Prune Flat premiered at the Expanded Cinema Festival in New York and continued in an off-Broadway run, an exceptional development within Whitman's milieu. In previous Theatre Works, like *American Moon* (1960), the audience was segregated into small coves or bays that opened onto the performance space. At the Film-Makers' Cinematheque, which hosted the 1965 Expanded Cinema Festival, the shallow proscenium stage encouraged a more traditional theatrical format but also enabled the confusion of the illusory depth on screen and real flatness on stage. Approximately 50 minutes in length, *Prune Flat* embraces at turns the cinematic—a film is projected onto a large screen at the front of the theatre—and the domestic—objects are handled on the shallow stage.[57] But the bulk of the piece mingles live bodies and projected images in a manner that can only be described as phantasmagoric. Two women in white outfits appear variously on screen and on stage. A third, labeled 'movie girl', also wears white. But rather than double an on-screen presence or camouflage into the projection, she becomes a human screen for a second projector and film. Movie girl performs mundane actions: she stands, sits, smokes a cigarette, and, most conspicuously, dresses and undresses, often changing into or out of whole outfits instantaneously. The actress who plays movie girl never changes her white smock dress, which serves as the screen. Instead, her own film image—at least in the initial performance—is projected back onto her. Synchronization between the actress and the projection ensures the confusion of body and image; the comparatively simple magic of montage facilitates the quick outfit changes (a classic stage magic routine that otherwise requires great skill). At the speed of 24fps, a green dress turns red, then blue; a black dress vanishes to reveal a nude woman; the nude suddenly wears black undergarments; she struts across the stage, pounces, and immediately sports a red dress. The two screens—architectural and human—share a single technology (film projection) and technique (montage). In the first instance, the effect is cinematic (proximity through distance); in the second, it is phantasmagoric (an assembly of humans and images).

   In *Prune Flat*, however, cinema is emplaced imprecisely. Part necessity, part design, the performer can never align herself perfectly with the projection; a ghostly doubling is visible unremittingly. The phantasmagoria itself

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57   Whitman alluded to some of the contradictory impulses in the work: 'I suggested in the piece itself that it was about movies. [...] I want people to understand that [the stage] world was manufactured. It is an object world.' Whitman in Kostelanetz, *The Theatre of Mixed Means*, pp. 224-225.

is haunted, a paradoxical presence that, as Branden Joseph argues, cannot be divorced from real-time techniques:

> *Prune Flat* splits time in much the same way as it virtualizes space. Irreducible to the pop art embrace of the simulacrum, Whitman's 'real time' is also not the phenomenological time of minimal sculpture, which opposed the spectator's physicality against its spectacular expropriation. [...] Whitman's time is a 'real time' presented directly despite the mediation of images, or, as he insisted, presented directly, and in 'depth', *because* of that very mediation. Whitman's deliberate, layered, bifurcated temporality allows a ghostly difference, a haunting deferral, to inhabit the moments that it puts on display.[58]

Joseph's insight applies widely—across and beyond Whitman's oeuvre. Indeed, it is imperative that we recognize a coherent aesthetic project in seemingly diverse works like *Shower* and *Prune Flat*. Whitman's neologisms—Cinema Pieces, Theatre Works—reflect, in part, the absence of a critical terminus able to describe his multimedia practice, let alone link it to related works by other artists, past and present. Such a term is phantasmagoria.

Like Whitman previously, video artist Bill Viola is regularly dismissed as too slick. The criticism is apt, no doubt, but in our non-judgmental review of phantasmagoria, it is beside the point. For few artists have mined the phantasmagoric as rapaciously as Viola. 'In almost all of Viola's works', Otto Neumaier has observed, 'the images become part of the architecture; they exist in space and time. [...] Many of Viola's works are essentially rooms, and it is vital to understand them as such.'[59] Video art leapt into phantasmagoria the moment it occupied entire rooms rather than reduced video to an image in a box. Viola's works are most compelling when they place these two registers in tension: phantasmagoric rooms and domestic boxes. A visitor to his 1988 installation, *The Sleep of Reason*, likely first encounters a wooden credenza atop which sit a vase with flowers, a lamp, an alarm clock set to the actual time, and a black-and-white television monitor in which one sees the face of a man asleep. At irregular intervals, the room is plunged into darkness, save for the alarm clock, and large, colour, moving images are projected on three walls, accompanied by loud and disquieting sounds. Fires rage, dogs pounce, and owls tear out of the night. The owl and title, of course, are borrowed from Goya's etching, *The Sleep of Reason Produces*

58 Joseph, 'Plastic Empathy', p. 82.
59 Neumaier, 'Space, Time, Video, Viola', pp. 52, 54.

Monsters (1799), created at the same time Robertson perfected his own monsters in the Phantasmagoria.

The tension between the two dispositifs is instructive. On the one hand, there is a grainy, black-and-white, diminutive, and nearly motionless image trapped in a box. On the other hand, there is the immersive and jarring seizure of the entire room. In the first instance, video is merely an object in domestic space, like the lamp, the vase, and the alarm clock. In the second instance, the domestic is suspended in favour of a phantasmagoric space for terrifying images and terrified—or at least entertained—viewers.[60] The inspired touch in the installation is the bridge between these two disparate dispositifs: the alarm clock. Unlike the table lamp or the room's illumination, the red glowing digits of the alarm clock never go black and never deviate from the actual time at the exhibition site. This real time weaves the domestic and phantasmagoric, the quotidian and the oneiric, into one space-time continuum.

The supersession of an object-based conception of video art grounded in the domestic by a phantasmagoric articulation is also in evidence in *Set of Coincidence* (1974), a single channel video by Peter Campus, a pioneer of video installations. The video opens with Campus, his back to the camera, staring at a television set whose screen displays gray-blue noise. Campus is soon joined by a (blue screen) double and, over the course of several minutes, the two perform a ghostly *pas de deux*. During the extended dissolve, the original set fades to reveal a blue screen set. As Campus asserted at the time: 'If we are to avoid the problem of creating a visual system that will reduce the capacity of the eye, it is necessary to disassociate the video camera from the eye and make it an extension of the room.'[61] The set of coincidence—where monitor and room coincide—is where the domestic gives way to the phantasmagoric. Here, Campus confronts himself as phantasmal image.

Campus' primary contribution to phantasmagoric video lay in his ground-breaking video installations. Where his single-channel work illustrated, an earlier installation, *Interface* (1972), performed the very coincidence of looking *through* and *at* that was endemic to Pepper's Ghost.

Here the viewer enters a dark, empty room, save for a large pane of glass, with a video camera and projector on either side. As viewers approach the glass, they see a double reflection. The first is a traditional mirror image. The second is real-time, black-and-white video captured through the glass by a camera on the far side. The double-image hovers in the centre of the

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60   It nearly goes without saying that the domestic here is staged and that the entire installation retains a phantasmagoric atmosphere, irrespective of the illumination or darkness of the room.
61   Campus, 'Video as a Function of Reality', p. 82.
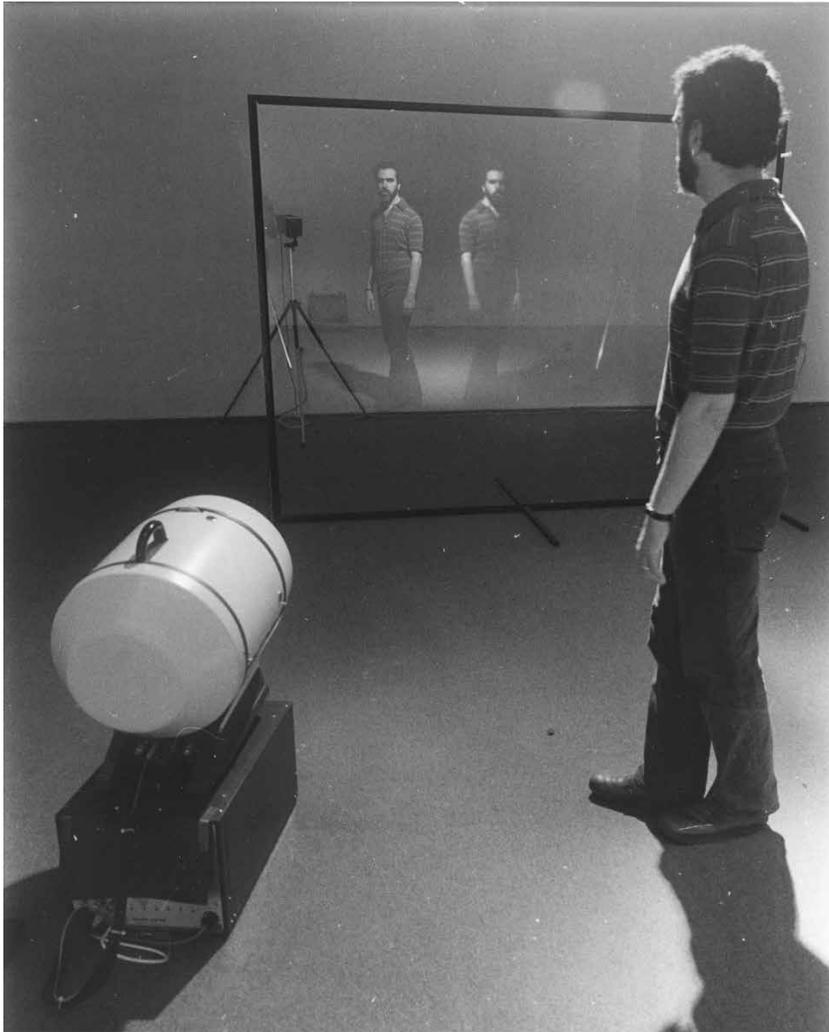
24. Peter Campus. *Interface*, 1972. Closed circuit video installation. Courtesy of the artist and Cristin Tierney Gallery, New York.

gallery, suspended on a glass screen in real space and real time. Because the video projection corrects for the mirror's left-right reversals, it can appear like a more accurate yet more alien double than the reflection, a reflection let loose, a Doppelgänger—in a word, a ghost.[62] As Wulf Herzogenrath

62   'Because we are conditioned to a reversed mirror image we are constantly surprised when the direct video image is presented. Any asymmetric movement causes loss of identification with the projected self-image.' Ibid., p. 83.

recognized early on, Campus' videos revolve around three main themes: 'double vision, dissolution of material reality, the question of which is the "real" picture'.[63] *Shadow Projection* (1974) performs the same ghost story, only with shadows instead of reflections. *Interface* and *Shadow Projection* are assemblies of bodies and their phantasms—in a word, phantasmagoria. And as in all phantasmagorias, their fundamental configurations cannot be sought in a single image, medium, technique, device, style, or psychological disorder. Instead, as Campus made clear, 'The answer to this is only apparent when the viewer becomes aware of the whole mechanism: the camera-projector-screen-viewer.'[64] The whole mechanism is nothing less than the phantasmagoric dispositif.

Coda: Occasional Phantasmagorias

Phantasmagoria still undergirds entire oeuvres. Tony Oursler's, for example, is likely the most diverse and conscientiously phantasmagoric artistic body of work ever produced. Where most artists chanced upon the phantasmagoric dispositif, Oursler has pursued it with the passion of a collector. He has amassed an archive of seminal and obscure books and pamphlets, images and curios, many of which touch on the history of phantasmagoria.[65] The influence of this archive on his work is pervasive. Most obvious is Oursler's eponymous installation *Phantasmagoria* (Musée des Arts Contemporains, Hornu, Belgium, 2013), awash in specific historical references to Robertson. No less significant is *Imponderable* (2015), a new video work on Spiritualism and its debunkers, created for a Pepper's Ghost contraption. Oursler's phantasmagoric magnum opus, of course, is *The Influence Machine* (2000), a sprawling outdoor installation where lampposts speak, texts run over fences, and faces are projected on buildings, trees, and smoke—the last a technique first employed by Schröpfer in the early 1790s, several years before Robertson launched his Phantasmagoria. But Oursler's most original contribution to the contemporary phantasmagoric is also his most enduring and famous technique: the projection of video faces, mouths, and eyes onto dolls, spheres, and other bulbous objects (many of which also speak). In countless video sculptures and video dolls, Oursler anchors moving

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63   Herzogenrath, 'Menschen-Bilder/ Picture of People', p. 11.
64   Campus, 'Video as a Function of Reality', p. 83.
65   See Wehr, *Imponderable*. An earlier and shorter version of this essay appeared as part of the catalogue.

images in the real world only to blur the boundaries between images and the real world.

Oursler, however, is an exception. More common is the occasional turn to the phantasmagoric. A delirious sampling might include interactive works like Valie Export's *Ping Pong. Ein Film zum Spielen – Ein Spielfilm* (1968) and David Claerbout's *The Rocking Chair* (2002-2003), or Rodney Graham's *Torqued Chandelier Release* (2005), where 35mm 48fps projection on a black screen creates a hallucinatory film loop that is equal parts *cinéma pur* and phantasmagoria. More systematically, Dan Graham has for decades conjured 'mirror "ghosts"' of spectators in his many glass and steel pavilions.[66] A work like *Two-Way Mirror Inside Cube* (1991) is 'both an optical device and an architectural modification of a previously unused [space.] [...] The two-way mirror has "cinematic" special effects.'[67] However much Graham has transformed the parameters of earlier phantasmagoric attractions like Pepper's Ghost, the visual, experiential, and discursive similarities are striking—so long as we recognize that the 'special effects' are not 'cinematic' but consummately phantasmagoric. Examples of phantasmagoric dance or theatre include works like *EJM 1-2* (1998), a ballet staged by the architectural duo Elizabeth Diller and Ricardo Scofidio—and co-produced with Charleroi Danses of Belgium and the Ballet Opera of Lyon—which employed rear-projection technology that quite nearly names its debt to the original phantasmagoria; any number of Wooster Group productions, such as their hypermediated rendition of that ultimate ghost story, *Hamlet* (2005); or Richard Maxwell's *Ads* (2010), where live actors are replaced with Pepper's Ghost videos. The whole domain of 3D film—whether mainstream or avant-garde, as in the decades-long pursuit of stereoscopic cinema by Ken Jacobs—demands to be scrutinized in relation to phantasmagoria.[68] Ultimately, this meager inventory could be multiplied many times over. And much more can and should be said about each of these examples. Suffice to say that, first, the phantasmagoric dispositif can help us account for diverse works otherwise unclassifiable by medium, technique, technology, influence, style, or any of the familiar categories of art and film history and theory. And, second, phantasmagoria is rising.

66   Graham in Alberro, *Two-way Mirror Power,* pp. 178-179.
67   Graham in ibid., pp. 165-166.
68   The best place to start is Elsaesser, 'The "Return" of 3-D', pp. 217-246. Ken Jacobs himself described *The Whole Shebang* (1982), one of his Nervous System pieces, in the following terms: 'Phantasmagorical monstrosities pull from the screen. Time doesn't stand still but runs in place'. Jacobs in Schwartz, *Films That Tell Time*, p. 27.

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