New Philosophy for New Media

Mark B. N. Hansen

The MIT Press Cambridge, Massachusetts London, England

Foreword

Tim Lenoir

Haptic Vision: Computation, Media, and Embodiment in Mark Hansen's New Phenomenology

The intertwined themes of ocularcentrism and disembodiment have been central to critical studies of new media since its beginnings more than two decades ago. Of course, metaphors of vision and light have always been coupled with notions of abstraction and immateriality, but in an era saturated with computer-generated imaging modalities the theme of disembodiment had taken on radical new dimensions. Electronic digitality has been accused of eviscerating the real and of liquidating reference, truth, and objectivity.[1] Whereas analog photographs adhered to reality by virtue of their physical modes of production, digital images are fabricated through layers of algorithmic computer processing with no trace of the materially mimetic qualities of film, (predigital) photography, or (analog) television. The digital image is a matrix of numbers, a table composed of integers, a grid of cells capable of being stored in computer memory, transmitted electronically and interpreted into an image by a display device (such as a video screen) or printer. Citing 1989 as the dawn of the post-photographic era when digital recording and processing began to replace photography, William Mitchell claims that "Images in the post-photographic era can no longer be guaranteed as visual truth—or even as signifiers with stable meaning and value."[2]

Having crossed into the territory of the post-photographic era, concern that electronic digitality was about to deterritorialize the human subject was not far behind. Closely associated with the loss of reference in the production of images, philosophers and media theorists such as Paul Virilio, Jonathan Crary, and William Mitchell registered a profound shift taking place in the

institutions constituting the subjectivity of the viewer and, indeed, even the dematerialization of the observer altogether. Jonathan Crary has argued that new technologies of image production have become broadly institutionalized within the military, medicine, science, media, and the arts, with a concomitant restructuring of traditional institutions, transformation of social practices, and instantiation of new belief structures. According to Mitchell, "A worldwide network of digital imaging systems is swiftly, silently constituting itself as the decentered subject's reconfigured eye."[3] For Crary this shift that is taking place in visual culture as a result of computer-based image processing signals that important functions of the human eye are being supplanted by practices in which visual images no longer have any reference to the position of an observer in a "real," optically perceived world. Crary writes,

> If these images can be said to refer to anything it is to millions of bits of electronic mathematical data. Increasingly, visuality will be situated on a cybernetic and electromagnetic terrain where abstract visual and linguistic elements coincide and are consumed circulated, and exchanged globally.[4]

For Crary, as for Mitchell, in the shift to digitality the embodied human observer with her repertoire of techniques for decoding sensations is displaced by a new abstract regime of computer code where standards of vision are set by machinic processes of pattern recognition and statistical sampling. With the advent of computer technology allowing a satellite, MRI scanner, or tunneling microscope to capture and process an image, then send it to another computer where the image is analyzed and interpreted in terms of other algorithms and data-processing techniques, vision becomes machinic; and in the process human observers are placed on the same plane as machines of vision.[5]

The work of Crary, Virilio, Mitchell, and others has directed attention to the power of manipulation inherent in new visualization technologies and the tendency of digital imaging to detach the viewer from an embodied, haptic sense of physical location and "being-there." Reflections on problems of reference connected with digital imaging were magnified and extended to other senses with the introduction of early work on virtual reality in the mid-1980s and early 1990s. But even prior to the development of practical VR systems, critical and popular discourse concerning the prospects of virtual reality and its

representation in literature and film coded the perception of new electronic media as abstract, disembodied, and decontextualized information. In his 1965 paper, "The Ultimate Display," Ivan Sutherland, who constructed the first head-mounted display in the 1960s preparing the way for experimentation with VR, emphasized the power of a digital display connected to a computer to reshape the physical conditions of embodiment: "There is no reason why the objects displayed by a computer have to follow the ordinary rules of physical reality," Sutherland wrote: "The ultimate display would, of course, be a room within which the computer can control the existence of matter."[6] Developing the notion of virtual reality as providing access to an abstract transcendent realm, in the first cyberpunk novel *Neuromancer,* William Gibson defined cyberspace as "a consensual hallucination" and as "the nonspace of the mind."[7] Such ideas were given powerful visual presentation in numerous popular films from 1982 to 1992, bracketed by *Tron* (1982) and *Lawnmower Man* (1992) in which protagonists are uploaded through the net into cyberspace and where bodies as informational patterns fuse in the ecstasy of virtual sex. The struggle over embodiment has continued in filmic representations right up to the present, thematized in films such as the *Matrix* trilogy, where obsolete humans struggle to regain their mastery over material reality and their own bodies, by becoming Zen masters of cyberspace embedded in a quantum-computational universe where the world is a computer and everything in it a simulation.

From the very beginning of critical engagement with computer technology, concern has been voiced about the potential, feared by many, celebrated by some, of the end of humanity. The fear that technological developments associated with computer technology, artificial intelligence, robotics, and more recently nanotechnology will succeed in displacing humanity through an evolutionary process leading first to a cyborg/human assemblage and ultimately to the extinction and replacement of the human altogether has been with us at least since the writings of Leroi-Gourhan in the 1960s.[8] These ominous early speculations have been repeated in various forms throughout the intervening years and have been given added substance by authoritative figures such as Bill Joy of Sun Microsystems, who titled his April 2000 *Wired Magazine* essay, "Why the future doesn't need us: our most powerful 21st century technologies—robotics, genetic engineering, and nanotech—are threatening to make humans an endangered species."[9] Sounding a different note, Ray Kurzweil, an

AI researcher and recipient of numerous awards including the 1999 National Medal of Technology for his inventions in the area of text and speech recognition, has put a celebratory twist on this story with detailed timelines and imaginative narratives of how the posthuman transformation will take place over the next decades: by 2040, Kurzweil predicts, fourth-generation robots will have human capabilities, and by 2099, according to Kurzweil, human thinking and machine intelligence will have merged with no meaningful distinction left between humans and computers.[10]

N. Katherine Hayles has given a useful summary definition of the view of the posthuman circulating in the musings of these theorists. According to Hayles, the posthuman view configures human being so that it can be seamlessly articulated with intelligent machines. In the posthuman, there are no essential differences or absolute demarcations between bodily existence and computer simulation, cybernetic mechanism and biological organism, robot teleology and human goals.[11] A central conception fueling this version of posthuman ideology is the notion of information as disembodied, a view that Hayles locates precisely in the Shannon-Weaver theory of information and the debates surrounding it among members of the early cybernetics movement in the Macy Conferences held from 1943 to 1954. The Shannon-Weaver theory, which set the agenda of those meetings, views information stochastically or probabilistically. The central notion of information in Shannon and Weaver's work is that the information carried by a message or symbol depends on its probability of being selected. It is carried discretely as symbols encoded as binary digits, which are selected from a set of possible symbols. For Shannon the issue was not about communicating significance or meaning but simply about optimizing the ratio of signal-to-noise in message transmission. Shannon measured information as inversely proportional to the probability of a signal reaching its receiver, and its quality in this formulation is determined by message length, complexity, and signal integrity. The *meaning* of the symbols encoding a message is completely irrelevant, though a binary digit may represent the toss of a coin (heads or tails) or the fate of the universe (expand or collapse). Hayles makes the valuable point that Shannon and Weaver sought a general formulation of information that could be calculated as the same value regardless of the contexts in which it was embedded. Conceived in this way information was in-

dependent of context, a probability function with no dimensions, no materiality, and no necessary connection with meaning.[12]

In contrast to the notion of information developed by Shannon and Weaver, which treated information as completely decontextualized and separate from meaning, the British researcher Donald McKay was developing an alternative notion that included recognizing not only the probability of selecting a message as its informational value, but also a structural component of a message that indicates how it is to be interpreted. Structural information in McKay's view is semantic and has to be calculated through changes brought about in the receiver's mind. This notion of information strongly correlates the nature of a representation with its effect, making information an action measured by the effect it has on the receiver. Put simply, whereas the Shannon-Weaver model treats what information is, the McKay model measures information by what it does. This mutual constitution of message and receiver seemed too subjective and difficult to measure and so was dropped by the American cyberneticists, even though it continued to be central for the British school of information theory. Hayles argues that alternative models of information were available. The path taken was not inevitable, and the (Shannon-Weaver) version that was accepted was due to historical contingencies related to the strength of allies and the availability of quantitative techniques associated with the Shannon model. An alternative discourse could have been constructed. Rather than simply acquiescing in a view of the posthuman as an apocalyptic erasure of human subjectivity, the posthuman, Hayles argues, can be made to stand for a positive partnership among nature, humans, and intelligent machines.

In *New Philosophy for New Media* Mark Hansen addresses the issues of embodiment, agency, and digitality that have been central to these debates concerning posthumanism. The key position Hansen sets out to critique is represented in the extreme by Friedrich Kittler. In *Gramophone, Film, Typewriter,* Kittler makes the Shannon-Weaver notion of information as disembodied the center of his own theory of new media. In one of his typically hyperbolic but eminently quotable statements, Kittler opens with the claim that when all movies, music, phone calls and texts reach households linked by optical fiber networks, the formerly distinct media of television, radio, telephone, and mail

converge, standardized by transmission frequencies to bit format. This convergence of all media under the digital regime actually spells the end of media. Media effectively become different interfaces to the ubiquitous flow of information:

> Before the end, something is coming to an end. The general digitization of channels and information erases the differences among individual media. Sound and image, voice and text are reduced to surface effects, known to consumers as interface. Sense and the senses turn into eyewash. Their media-produced glamour will survive for an interim as a by-product of strategic programs. Inside the computers themselves everything becomes a number: quantity without image, sound or voice. And once optical fiber networks turn formerly distinct data flows into a standardized series of digitized numbers, any medium can be translated into any other. With numbers, everything goes. Modulation, transformation, synchronization; delay, storage, transposition; scrambling, scanning, mapping—a total media link on a digital base will erase the very concept of medium. Instead of wiring people and technologies, absolute knowledge will run as an endless loop.[13]

With digital convergence Kittler sees human perception—indeed human beings themselves—becoming obsolete. As Hansen points out so forcefully, according to Kittler in the post-medium condition, the pure flow of data will no longer need to adapt itself to human perceptual ratios. In contrast to Kittler, here a representative of theorists who focus on digital media as sites of disembodiment, Hansen has developed a new phenomenology, elaborated in dialogue with the works of Walter Benjamin, Henri Bergson, and Gilles Deleuze, which emphasizes the role of the affective, proprioceptive, and tactile dimensions of experience in the constitution of space, and by extension visual media. For Hansen visuality is shaped in terms of these more visceral bodily elements rather than by the abstract power of sight, and he maintains that the body continues to be the active framer of the image, even in a digital regime.

New Philosophy for New Media builds on and radically extends some crucial notions from Hansen's first book, *Embodying Technesis: Technology Beyond Writing.* Crucial to both works is a radical break with representationalism and

indeed with the tendency to assimilate phenomena of both natural and technical agency to linguistic models—the problem of incorporation. The problem of relating language to practice has been a key concern for theorists of various disciplines. The problem is particularly salient for issues of how code and program are inscribed in material reality no less than how disruptive changes in bodily experience get assimilated to language. Hansen simply cuts the Gordian problematic of how inscription relates to incorporation and the related issues of theory to practice and of representations to material agency. For over a decade science has sought accounts for how theoretical representations of nature are constructed and attached to the world. Some of us looked to poststructuralist approaches that took up issues of the technologies of representation, inscription and the material aspects of communication, frameworks deriving from literary and media scholars such as Derrida and Friedrich Kittler. Closely allied with such approaches have been laboratory-intensive accounts such as Hans-Jörg Rheinberger's account of "epistemic things," while others explored sociologically inspired models of the "mangle of practice" and "trading zones," or the construction of "epistemic cultures." As Hansen has shown brilliantly, there was a deep-seated ambivalence about material agency in these studies. On the one hand we wanted to grant practice and indeed even technology a materiality of its own—Bruno Latour has even advocated a Parliament of Things—but on the other hand, nature and technology in these accounts are always somehow "humanized" as a social/cultural construction. In his first book, *Embodying Technesis,* and in the rich elaboration and extension of the model in *New Philosophy for New Media,* Hansen criticizes theorists from the fields of poststructuralist theory and cultural studies for having stopped short of embracing the truly radical aspects of their critical stance toward representationalism. According to Hansen, Derrida, Bourdieu, Baudrillard, and others all engaged in a common pattern of reduction—Hansen calls it *technesis*—in which a stated interest in embracing technological materiality is compromised in order to safeguard the integrity and autonomy of thought and representation. He shows that this strategy functions by collapsing radical material exteriority into a merely relative exteriority paradoxically situated *within* the domain of thought.

Hansen's aim is to offer a positive program for embracing the rich materiality of technology that frees it from being embedded in discourse and

representation. The position he stakes out draws deeply on Henri Bergson's defense of the affective, prediscursive body as the active source of meaning. Hansen finds empirical support for this Bergsonist program and its relevance to our current concerns about posthumanism and digitality in the work of cognitive scientists such as Francisco Varela, Edwin Hutchins, Andy Clark, Antonio Damasio, and others who have defended the notion of the extended mind. From Hansen's perspective technologies alter the very basis of our sensory experience and drastically affect what it means to live as *embodied* human agents. They accomplish this by reconfiguring the senses at a precognitional or even paracognitional level (not to privilege one level over the other) prior to conscious perception and assimilation to language.

This bold and ambitious program was only sketched in *Embodying Technesis. New Philosophy for New Media* carries that program further by offering an account of how the body is modified through interactions facilitated by digital technology. The key notion is that of the frame. Despite the fact that Bergson did not find much material relevant to his theory of perception in early cinema, which was in its infancy exactly at the moment Bergson was writing, he characterized the external world as a universal flux of images. The body is itself an image among other images—in fact a very special kind of image Bergson calls a "center of indetermination," which acts as a filter creatively selecting facets of images from the universal flux according to its own capacities. The body, then, is a source of action on the world of images, subtracting among external influences those that are relevant to its own interests. Bergson calls such isolated image components "perceptions."

Gilles Deleuze argued that the notion of the movement-image based on cut and montage, indeed the entire process of framing at the heart of mature cinema was in fact a perfect analogue to the world of images described by Bergson, where "image = movement."[14] He sought to correct Bergson's dismissal of cinema by redeeming it as an experimental laboratory for philosophy: a site for studying perception, representation, space, time, and memory; a medium for grasping the shifting relationship of the articulable and the visible—ontology; a site for exploring the classification of images and signs as preparatory for the creation of concepts—epistemology. Hansen argues, however, that in claiming Bergson for his own philosophy of the cinema, Deleuze recast essential components of Bergson's bodily aesthetic, most crucially the faculty of affection.

In his commentary on Bergson, Deleuze defines the "affection-image" as the third component of subjectivity, filling the interval between the other two components, perception and action. This move seems perfectly consistent with Bergson, but Deleuze introduces a subtle change that manages to subsume affection as a subcomponent of perception. Affection, for Deleuze, designates a modality of perception: indeed, an attenuated or short-circuited perception that ceases to yield an action, and instead brings forth an expression. (In film, it is the close-up shot of the face.) By rendering affection as a variety of perception, Deleuze has fundamentally transformed Bergson; for in *Matter and Memory* Bergson treated affection as an independent bodily modality in its own right differing in kind from perception. According to Hansen, Deleuze effectively dissolves the constitutive link of affect to the body and appropriates it to the movement-image. This gesture enables Deleuze to define the body as an assemblage of images:

> All things considered, movement-images divide into three sorts of images when they are related to a centre of indetermination as to a special image: perception-images, action-images, and affection-images. And each one of us, the special image or the contingent centre, is nothing but an assemblage of three images, a consolidate of perception-images, action-images and affection-images.[15]

In effect Deleuze has reduced affection to a formal process of technical framing, and in the process he has disembodied affect, locating it outside the subject in the world of technically assembled images. In this account the body becomes relatively passive, a site of technical inscription of movement-images instead of the active source framing otherwise formless information. On the one side is the world of preformed images, technically framed as movement-images; on the other is the sensorimotor apparatus of the individual that passively correlates them.

Hansen turns to recent developments in new media and the neurosciences to provide an alternative to Deleuze's reading of the affect-image and to reclaim Bergson's understanding of embodiment in an account of how the body "enframes" information. Rather than erasing an active role of the sentient body in the production of media effects as Friedrich Kittler's interpretation of

digital media would have it, Hansen argues that media convergence under digitality actually increases the centrality of the body as framer of information: as media lose their material specificity, the body takes on a more prominent function as selective processor in the creation of images. The digital image on a computer screen is no longer the same object as the photograph it may digitally simulate. In contrast to this static object, the digital image involves a processing of data, the constant refreshing of the interpretation of that data through an interface projected on the screen at a frame rate that makes it appear static, but this image is in fact highly dynamic, capable of being modified at any moment. The digital image is processual. It is also capable of supporting interactivity of the user, who can click on a portion of the image, zoom in, or initiate another operation through a hyperlinked connection. In certain applications the image is in fact an interface to some remote action, such as a surgical procedure.

Hansen argues that the processual and interactive features of the digital image provide grounds for replacing the notions of the time-image and movement-image as described by Deleuze. In their place a new image regime, the digital image, is emerging. Based on the act of enframing information, Hansen argues the digital image, an interactive techno-sensorimotor hybrid, should be seen as the source for any technical frame designed to make information perceivable by the body. *New Philosophy for New Media* is Hansen's brilliant phenomenological odyssey aimed at critiquing and revising Deleuze's treatment of the movement-image in which the cinematic image is purified of connection with the human body, and resuscitating and updating Bergson's notion of the primary framing function of the body by aligning it with recent developments in information technology and new media arts. Hansen argues that every image regime, including the digital, is primarily enframed by an "embryogenic" connection with the human body. In contrast to Deleuze's arguments on technical framing as the source of the image, which is then correlated to the body—indeed, inscribed on the body as screen—Hansen's "Bergsonist vocation" asserts that there is no information (or image) in the absence of the form-giving potential of human embodiment.

To update Bergson's pre–Information Age perspective, Hansen draws on a number of theorists, most notably on the work of Raymond Ruyer,[16] an overlooked French information theorist who shared and extended Donald McKay's critique of the Shannon-Weaver notion of information by arguing that infor-

mation requires a frame to be constituted as information, and that frame is provided by the active constitution and assembly of human embodiment. Following this line of argument, "machinic vision," the turn of phrase in recent work where computers are claimed to process data into images that are then sent to other computers to be read, is something of an oxymoron. This can be "vision" only by analogy in Hansen's view. Vision, indeed any system involving "information," requires an interpreter, and that interpreter is the material human body grounded in the wetware of our sensorimotor systems.

Deleuze presented his complex cinematic philosophy as a deep conversation with the works of semioticians, phenomenologists, and the products of cinematic art, such as the works of Eisenstein, Vertov, Griffith, Hitchcock, and many others. In a similar fashion Hansen's rich new media philosophy is born from dialogue with the works of Bergson, Deleuze, and many contemporary theorists of digitality and new media, all interwoven in a complex critical appreciation of the works of new media artists. Hansen's analyses and interpretations of these new media artworks, many of which are challenging in their own right and by no means transparent, demonstrate an incredible depth of appreciation and will serve to orient a critical audience to these important works. But Hansen's goal—carried off masterfully—is to include new media artwork as evidence for the various stages of his debate with Deleuze, Kittler, and others, in his rehabilitation and updating of Bergson for the digital age. Hansen's defense of a Bergson-inspired approach to media requires an expansion and indeed inversion of the hierarchy of the senses that has occupied art historical discourse on digital media. Jonathan Crary and many other theorists who have followed his lead have argued that new digital media are relocating vision to a plane severed from a human observer while traditional functions of human vision are being supplanted by new media practices in which visual images no longer refer to the position of an observer in a "real," optically perceived world. Hansen takes issue with this view and argues for displacing an abstracted sense of vision as the primary sense in favor of the internal bodily senses of touch and self-movement. Vision becomes "haptic" in Hansen's effort to relocate visual sense-making in the body. Hansen argues for the primacy of affective and interoceptive sensory processes that generate a "haptic spatiality," an internally grounded image of the body prior to and independent of external geometrical space. This view has a range of interesting consequences for the

interpretation of other new media. For instance, virtual reality in Hansen's view is not the simple product of technical advances in computer graphics. The ability to process more polygons and run hierarchies of shading algorithms faster is not the only source of the virtual reality experience, but is rather grounded in the biological potential of human beings. Virtual reality, Hansen argues, is a body–brain achievement. The source of the virtual is thus not technological, but rather a biologically grounded adaptation to newly acquired technological extensions provided by new media. In making his argument Hansen draws selectively on the work of new media artists that foreground the shift from the visual to the affective, haptic, and proprioceptive registers crucial to the Bergsonian turn.

The fruitful conversation Hansen elicits among new media artworks, neurobiology, and phenomenology throughout the book is an impressive achievement. As an illustration the final chapter of the book is a tour de force treating the central problematic of the book. The centerpiece of the Bergsonian turn, of course, is the theory of affect. The affective body is the "glue" that underpins consciousness and connects it with subperceptual sensorimotor processes. It is through this affective channel that Hansen wants materially to link the flow of information in the digital image and the body as frame. Recent work in the neurosciences provides the material link he is looking for. Francisco Varela, in particular, made a powerful argument about the sources of time consciousness that perfectly suits Hansen's thesis.

In his work on what he called "enactive cognition," Varela argues that mental acts are characterized by the concurrent participation of several functionally distinct and topographically distributed regions of the brain and their sensorimotor embodiment. All forms of cognitive act arise from coherent activity of subpopulations of neurons at multiple locations. They are dynamic self-organizing patterns of widely distributed regions of the brain rather than organized as sequential arrangements as the computer metaphor—information flows upstream—would model it. At the deepest level the relation and integration of these components gives rise to temporality. Varela writes:

> A central idea pursued here is that these various components require *a frame or window of simultaneity that corresponds to the duration of the lived present.* In this view, the constant stream of sensory activation and motor

of emotion in still images from video shot at this speed (384 frames per second), Viola concludes that "emotions are outside of time." In several installations Viola has experimented with this idea by digitally converting to video film shot at high speed and then projecting the resulting video back at normal speed. As Hansen notes, the cinema-digital-video hybrid technique exposes the viewer to minute shifts in affective tonality well beyond what is visible to natural perception. In Varela's terms, Viola's installations technically expand the "now" revealing the role of affect in the flux of consciousness. Rather than machinic components inscribing and controlling the flux of consciousness, Viola's work uses digital technology as a mediator for making visible the imperceptible affective processes framing the digital image.

This example is emblematic of the thesis Hansen works throughout *New Philosophy for New Media.* Viola's hybrid digital video installation illustrates the positive engagement of the body with technology. We are daily exposed to machinic events, such as the processing of data flows in our computers, and increasingly we are becoming immersed in a ubiquitous computing environment of machinic processes transpiring well below the .3 sec threshold of the "now." Rather than being the unconscious sites of inscription for these digital flows—sites that may be of limited use in a future posthuman environment—Hansen argues that new media art such as Viola's demonstrates how the affective and sensorimotor body serves to catalyze and frame information into the human-perceived digital image. In a very material sense the body is the "coprocessor" of digital information. Moreover, while Hansen's digital aesthetic views technology as an extension of human capability that enlarges the grasp over the material world, his analysis of works such as Viola's *Quintet for the Astonished* underscores that life is ultimately creative, unrecordable, and always in excess of what can be inscribed and made available for repetition. *New Philosophy for New Media* is a challenging work of astonishing breadth and erudition, offering timely resources for engaging questions of posthumanity.

Notes

1. Jean Baudrillard, *Simulations,* New York: Semiotext(e), 1983, pp. 2–4.

2. William J. Mitchell, *The Reconfigured Eye: Visual Truth in the Post-Photographic Era,* Cambridge, Mass.: MIT Press, 1992, p. 57. Mitchell noted that in 1989, the sesquicenten-

eds., *Naturalizing Phenomenology: Issues in Contemporary Phenomenology and Cognitive Science,* Stanford, Calif.: Stanford University Press, 1999, pp. 272–273 (italics in original).

18. Ibid., pp. 276–277.

19. Ibid., pp. 295–298.

20. Ibid., p. 301.