INTRODUCTION

THE VIRTUAL WINDOW

FRAMING VISUALITY: FROM ALBERTI TO MICROSOFT

Vision itself has a history.

—Heinrich Wölfflin, *Principles of Art History*

The window is an opening, an aperture for light and ventilation. It opens, it closes; it separates the spaces of here and there, inside and outside, in front of and behind. The window opens onto a three-dimensional world beyond: it is a membrane where surface meets depth, where transparency meets its barriers. The window is also a frame, a proscenium: its edges hold a view in place. The window reduces the outside to a two-dimensional surface; the window becomes a screen. Like the window, the screen is at once a surface and a frame—a reflective plane onto which an image is cast and a frame that limits its view. The screen is a component piece of architecture, rendering a wall permeable to ventilation in new ways: a "virtual window" that changes the materiality of built space, adding new apertures that dramatically alter our conception of space and (even more radically) of time.

WE KNOW the world by what we see: through a window, in a frame, on a screen. As we spend more of our time staring into the frames of movies, television, computers, hand-held displays—"windows" full of moving images, text, icons, and 3-D graphics—how the world is framed may be as important as what is contained within that frame.

In his 1435 treatise on painting and perspective, *De pictura,* Leon Battista Alberti—painter, architect, scholar of antiquity, quintessential Renaissance man—famously instructed the painter to "regard" the rectangular frame of the painting as an open window (*aperta finestra*).[1] Alberti's text serves as my starting point, not because his is the first account of the transformation of three-dimensional space to the planes of two-dimensional representation, but because of his striking use of the architectural figure of the window. Alberti's Renaissance metaphor of the window has haunted centuries of subsequent thinking about the humanist subject of perspective, and has remained a defining concept for theories of painting, architecture, and moving-image media.

Unlike the metaphor of the window as a frame for perspectival view, the metaphor of the window in computer software relies on a different set of assumptions about the viewer and the view that the window provides. An early component of the graphical user interface, the computer "window" referred not to the full expanse of the computer screen, but rather to a subset of its screen surface: an inset screen within the screen of the computer, one of many nested on its "desktop."[2] The computer "window" shifts its metaphoric hold from the

singular frame of perspective to the multiplicity of windows within windows, frames within frames, screens within screens.

In the centuries since Alberti, single-point perspective and its concomitant symbolic system have been challenged on many fronts: by changes in perspective in modern painting; by modern architecture's replacement of the "perspectival" window with the horizontal window or "picture wall"; by moving-image technologies that provide a temporal exponent to spatial perspectivalism. Yet these challenges to perspective occurred with a stuttering anachrony in different media. In *The Origin of Perspective* (1995), Hubert Damisch chronicled many challenges to the "perspective paradigm" in painting and architecture and yet maintained: "Without any doubt, our period is much more massively informed by the perspective paradigm, thanks to photography, film and now video, than was the fifteenth century, which could boast of very few correct perspective constructions."[3] This insight may hold true for many uses of photography, film, and video (if one accepts the camera as an apparatus that renders mechanically produced perspective), but does not address the perspectival "shifts" when images move or follow each other in sequential display. Although it may seem that cinematic, televisual, and computer-based representations continue to rely on perspectival positioning, a key component of my argument is to suggest otherwise. The complex relation between perspective and the moving image necessitates a more refined account of the viewer's position in space in relation to a fixed frame with either static, moving, multiply layered, obliquely angled, abstract, sequential, or multiple-frame images. As moving images follow each other, the shifts of editing offer the viewer multiple perspectives but sequentially and within a fixed frame. Here it will be important to consider how, through most of the cinematic century, the dominant form for the moving image was, with striking consistency, a single image in a single frame. The fractured modernisms of cubist painting, photographic collage, architectural transparency—post-perspectival techniques that multiply and layer the planes of representation spatially and temporally—were strategies that remained only exceptions, experiments, the "avant-garde," in the vernacular forms of moving-image media.[4]

Perspective may have met its end on the computer desktop. As computing devices added a screen for the display of data, the graphical user interface (GUI) introduced an entirely new visual system—a text or image in one "window" meets other texts or images in other "windows" on the same screen. Above, below, ahead, and behind are simultaneous on the computer display, where each element in composition is seen separately with no systematic spatial relationship between them. Although the algorithmic constructions found in video games, in QuickTime panoramas, in virtual reality systems continue to

rely on digital simulacra of perspectival space, not all digital space is designed to suggest three dimensions.[5] Instead, the vernacular "space" of the computer screen has more in common with surfaces of cubism—frontality, suppression of depth, overlapping layers—than with the extended depth of Renaissance perspective. In this way, computer-generated virtual spaces coexist with the vernacular daily virtual spaces that we inhabit (or at least sit in front of) as viewers and users, in the same way that perspectival painting coexisted with its challengers. Microsoft, the corporate Goliath, figures not so much as the endpoint of this account but as a marker of the commercial alchemy of metaphor turned to commodity capital, making "windows" proprietary. (Indeed, the Microsoft version of windows has in many ways overtaken its architectural referent. A quick Google search will bring up more references to Windows than to architectural apertures.)

As I will detail in a later chapter, there have been sporadic examples of multiple-frame images and multiple-screen display throughout the century-long history of cinematic and televisual media. And yet aside from some notable historical anomalies, only in the last two decades—markedly with the advent of digital imaging technologies and new technologies of display—did the media "window" began to include multiple perspectives within a single frame.[6] And as a coincident development, the interface of computer display made this "new" multiple-"window"/multiple-screen format a daily lens, a vernacular system of visuality.[7] This remade visual vernacular requires new descriptors for its fractured, multiple, simultaneous, time-shiftable sense of space and time. Philosophies and critical theories that address the subject as a nodal point in a communicational matrix have failed to consider this important paradigm shift in visual address.

Underneath this layer of argument lurks another one, equally historically situated, yet perhaps more difficult to chronicle. In the last two decades, with accelerating speed, the media-specific distinctions between cinematic, televisual and computer media have been eroded beyond recognition by the digital technologies that have transformed them. While the development of digital technologies of image production, delivery, and display have helped to remake the visual syntax of the screen, many formal strategies (composites, multiple-frame images, multiple-screen projections) existed before digital technology. Hence it may be important to soften the agonistic claims of a technologically determined digital break.[8] Digital compositing technology eased the combination of live action, animated, and computer-generated images in cinematic and televisual production, and yet the turn-of-the-century magician-turned-filmmaker Georges Méliès could equally be considered as a compositing

technician—conjuring a world that did not exist outside of the filmmaking apparatus, a world with its own physical laws. Méliès's predigital trick films could be tagged with one of the common descriptors for digital compositing—"postindexical." (Or, more precisely, given our historical vantage, they might be considered *proto*-post-indexical.)[9] Here, a taxonomy marking the specificities and lost specificities of the film, television, and computer screen seems necessary. How do we parse the media distinctions between image production (shot on film, video, "born digital"?); postproduction (transferred from film to video to computer-generated digital effect or in the reverse direction from CGI to video or film?); and "screen practice" (projected on a large screen, transmitted via broadcast, cable, satellite, or seen on computers, portable DVD screens, or streaming online on WebTV)? The movie screen, the TV screen, and the computer screen may still occupy separate spaces (their very location changes our concept of spectatorship—the place of the computer in the home or in the workplace is quite different from the domestic lodging of the TV set), but their cross-purposed interaction poses new questions about medium-based specificity. As Nicholas Negroponte asserted a decade ago: "The medium is no longer the message in the digital age."[10]

To situate the technical underpinnings of this convergence requires a yet-to-be-written intermedial history of cinema, television, and computer technologies. Siegfried Zielinski's exemplary intertwined history of cinema and television, *Audiovisions: Cinema and Television as Entr'actes in History* (1988), eloquently demonstrates the development of these two media, in reaction to or in concert with each other.[11] As the media of movies, television, and the Web now routinely interact among themselves, a history of moving-image technologies segregated from histories of electricity, telephony, telegraphy, photography, radio, and computing technologies denies the intermedial complexity of technological development.

Virtual images radically transformed the twentieth-century understanding of reality. A long list of writers struggled to assess the changes in scale, time, space, and consciousness produced by technological enhancements to human vision—Paul Valéry, Walter Benjamin, Sigfried Giedion, and Lewis Mumford; Marshall McLuhan, Raymond Williams, Jean Baudrillard, and Paul Virilio; Donna Haraway, Nicholas Negroponte, Vivian Sobchack, and Lev Manovich.[12] My debts to these and other theorists should be evident in my methodological mix of historiographical exegesis with theoretical inquiry and polemic. The screens of cinema, television, and computers open "virtual windows" that ventilate the static materialities and temporalities of their viewers. A "windowed" multiplic-

ity of perspectives implies new laws of "presence"—not only here and there, but also *then* and *now*—a multiple view—sometimes enhanced, sometimes diminished—out the window.

WINDOW FRAME SCREEN

WINDOW

> *What one can see in the light of day is always less interesting than what happens behind a pane of glass.*
>
> —Charles Baudelaire, "Windows"

From the mid-fifteenth-century writings of Leon Battista Alberti to the late-twentieth-century computer software trademarked by Microsoft as Windows™, the window has a deep cultural history as an architectural and figurative trope for the framing of the pictorial image. An opening in architectural space, the window supplies a common metaphor for the various frames that form its virtual analogs—the frame of the painting and the photograph, the screens of movie, television, and computers. Alberti's Renaissance metaphor drew upon the window as an analog for the perspectival frame of the painting; since then, the window and its common metaphysical corollary—perspective—have remained central figures in theorizations of the space of vision. The following study examines the figure of the window as a key measure of epistemic changes in representational systems from painting to photography to moving-image media and computer display.[13]

FRAME

Like the frame of the architectural window and the frame of the painting, the frame of the moving-image screen marks a separation—an "ontological cut"—between the material surface of the wall and the view contained within its aperture.[14] Starting at the end of the nineteenth century, the projection of moving images—the cinema as it was developed and exhibited—relied on the immobility of its spectators and the aperture of a fixed frame. This newly wrought combination of mobile and virtual visualities provided a *virtual mobility* for immobile spectators who witnessed movement confined to a frame.[15] As cinema "spectators" we sit immobile in front of moving images; our bodies do not move, but our "point of view" may change. Film theorists have long sought to account for the immobile spectator's experience of cinematic space. Theorizations of televisual space and the television "viewer" require many of the same distinctions between the mobile/immobile, mediated/"real."[16] As a viewer of *virtual*

images, the moving-image spectator has a bodily presence in material architectural space, yet engages with virtually rendered immaterial space framed on the screen. As computer "users," we spend hours immobile in front of the flat, multicapable, framed virtual space of the computer screen. The frame becomes the threshold—the liminal site—of tensions between the immobility of a spectator/viewer/user and the mobility of images seen through the mediated "windows" of film, television, and computer screens. But the frame also separates the *materiality* of spectatorial space from the *virtual immateriality* of spaces seen within its boundaries.[17]

While the tensions between mobility and stasis, materiality and immateriality, may seem at first to be purely spatial paradoxes, they also have a temporal component. As a unique tool of modernity, the cinema freed its spectators not only from the bindings of material space but also from the bindings of time.[18] The cinema spectator engages in the fluid temporalities of cinematic construction—flashbacks, ellipses, achronologies—as well as in time frames other than the spectator's moment in historical time, whether she is watching the diegetic fiction of a period drama or a film from an earlier period. And as television and VCR-based (and now PVR-based) televisuality began to take the cinema's essential temporal *flânerie* to even more time-shifted extremes, our access to history and to the past changed dramatically.[19] These emerging habits of cinema and televisual spectatorship, visual practices that routinely engaged with virtual and mobile visualities, have helped to shape a newly mediated *episteme*.[20] As a measure of the frame's metaphysical consequence, it will be necessary to question both the discursive and material practices of "framing" the visual field.[21]

SCREEN

As the twentieth century ended, new systems of circulation and transmission began to replace the cinema's projection screen and to link, as well, the screens of the television and computer with the dialogic interactivity of the telephone. "Convergence"—once merely a discursive buzzword—has become a literal description of the codependency of the movie screen, TV screen, and computer screen. Once seen as the paradigmatic twentieth-century medium, the "cinema" has become embedded in—or perhaps lost in—the new technologies that surround it. Cinema now merely forms an originary visual system for a complexly diverse set of "postcinematic" visualities.

Screens have become a pervasive part of daily experience. Buildings are adorned with screens as exterior walls, sports stadiums add Jumbotrons to the proscenium space of spectacle, screens show games to sport spectators in a time

loop of instant replay and a crosscut to its fans, fighter pilots and military strategists conduct maneuvers on screens with global positioning, televisions have gaming consoles and eye-toys, computers interface with other screens and digital archives, PDAs browse the Web, cell phones take and transmit photos. Our physically embodied and subjectively disembodied relation to the screen changes as we engage with the distant, large cinema screen with projected images; the closer and light-emanating television screen; and the even closer computer screen, one that we put our faces very close to, often touch, one that sits on our laps or in our beds. Camera phones, BlackBerries, and other "mobile screenic devices" add mobility to the screen's face.[22]

Production techniques, display technologies, and delivery platforms have jumbled the predigital/digital divide into uncertain convergences in a rapidly shifting technological terrain. As screens multiply in a proliferation of "display technologies," an equally daunting number of "delivery platform(s)" compete to supply images and sounds: videotapes, CDs, CD-ROMs, DVDs, MP3, "streaming" audio and video on the Web. A variety of screens—long and wide and square, large and small, flat and fat, composed of grains, composed of pixels, lit by projected light, cathode-ray tube, plasma, LCD—all compete for our attention without any convincing arguments about hegemony.

Here it might be useful to extend Wittgenstein's incisive epigram, "The limits of my language are the limits of my world," to its visual corollary: the limits and multiplicities of our frames of vision determine the boundaries and multiplicities of our world. As the beholders of multiscreen "windows," we now receive images—still and moving, large and small, artistic and commercial—in spatially and temporally fractured frames. This new space of mediated vision is post-Cartesian, postperspectival, postcinematic, and posttelevisual, and yet remains within the delimited bounds of a frame and seen on a screen.

THE VIRTUAL AND ITS WINDOW

In the glare of a jargon-ridden present, the term "virtual" may have lost its descriptive power. As the term gained wide currency in debates about cyberspace and virtual reality in the 1980s and 1990s, it became a routinely and reflexively deployed adjective. By returning to the term's definition and etymology, I hope to reclaim its considerable utility for making distinctions about the ontological status—and the materiality versus the immateriality—of an object. In this way, I find it necessary to challenge accounts that assume that "virtual" refers only to electronically mediated or digitally produced images and experiences, and to decouple the term from its unquestioned equation with "virtual reality."

> **Virtual** (Latin, *virtus,* for strength or power) of, relating to, or possessing a power of acting without the agency of matter; being *functionally or effectively but not formally* of its kind.[23]

The virtual is a substitute—"acting without agency of matter"—an immaterial proxy for the material. The term becomes a key marker of a secondary order in the relationship between the real and its copy, the original and its reproduction, the image and its likeness. Here it is necessary to clarify the relation between "virtual" and the Latin term *simulacrum*—where the image has no referent in the real. "Virtual" refers to the register of representation itself—but representation that can be either simulacral or directly mimetic.[24]

The Platonic dismissal of the image as untrue, a "false claimant" to the real, receded as the term "virtual" entered into writings on optics and became less charged with negative associations. By the seventeenth century, theories of light rays and their refraction—geometric principles first devised in antiquity by Euclid—were reformulated as optical researchers learned more about the physiology of the eye, the crystalline lens, and the retinal screen. Working within the tradition of medieval geometers, Johannes Kepler described how the crystalline "lens" of the eye focused intromitted light rays from many points in the visual field to form a point-to-point correspondence on the retina as an inverted image. Kepler's *Ad Vitellionem paralipomena* (1604) distinguished between two kinds of images—the *imago,* which could be seen but not measured, and the *pictura* which could be focused on walls and other surfaces and could be measured.[25] While the optical principles delineated by Kepler, Galileo, Snel, Descartes, and others did not make the exact distinction between "virtual" and "real," these thinkers did distinguish between the *imago,* the image without physical substance, and the *pictura,* the reflection on the retina. The *pictura* had a materiality of its own, but one quite different from that of the object in the world. Despite the inherent differences in their materialities and how they were produced, the retinal *pictura* was, like the painting (*pictura*), already in the register of representation. In order to explain how and why the image on the retina was inverted, Kepler—and later, Descartes—invoked the apparatical model of the camera obscura to describe the principles of the eye, the lens, and the retinal wall.[26]

In seventeenth- and eighteenth-century optics, "virtual" was used to describe an image that was seen by looking through a lens or that appeared in a mirror.[27] The term "virtual" first appears in English in the writings of Sir David Brewster about the properties of refraction in his *Treatise on Optics* (1831).[28] Best known for his 1816 invention of the kaleidoscope (an optical device that demonstrated the principles of reflective symmetry), Brewster described the differing proper-

ties of an image seen by the eye and an image seen through the mediation of a lens. A "real image" is formed by the convergence of rays of light and is visible to the eye, but will also appear on a surface that is placed in a plane with the image. A "virtual image"—perceived in the brain—is visible to the eye but will not appear on a surface placed in its plane. Hence a "virtual image" in Brewster's optics is not recuperable to representation. This meaning of "virtual" suggests an intangible, uncapturable, ineffable appearance—more *imago* than *pictura.*[29]

Although the virtual image was first described as a purely retinal image, it also became tied to representation as a descriptor for the secondary register of representation, the *pictura.* A "virtual image" may also be produced through the refracting mediation of a lens or the reflecting mediation of a mirror. Both of these optical meanings for "virtual"—an image produced in the brain without referent in the world, and an image produced out of some optical mediation—form precedents to the use of the term in the contemporary vernacular. Both meanings (that of the simulacral and the mimetic) imply a separate ontological register, an immaterial form that is *functionally but not effectively* material. The semantic slippage between the virtual image that has no material existence (appears in the brain, on the retina) and the virtual image that is formed in representation signifies a subtle shift in its materiality.

A virtual image begins to have its own liminal materiality, even if it is of a different ontological order. And, of course, both of these meanings were in use centuries before electronic or digital optical systems of representation. As Elizabeth Grosz bluntly states: "We did not have to wait for the computer screen or the movie projector in order to enter virtual space; we have been living in its shadow more or less continually."[30]

At the end of the nineteenth century, the notion of "the virtual" played a crucial role in the philosophy of Henri Bergson.[31] In *Matter and Memory* (1896), Bergson uses the term "virtual" to depict the immateriality of memory.[32] The recent revival of interest in Bergson's writing, largely due to the interest taken in him by Gilles Deleuze, may also be attributed to the number of concepts that he deployed—"virtuality," "difference," "multiplicity," "mobility"—which resonant with contemporary philosophical debate.[33] (I will discuss Bergson's concept of the virtual at greater length in "Lens III: Bergson's Virtual.")

Deleuze reworks Bergson's biological metaphor of "creative evolution," using the virtual as a key difference: "Evolution takes place from the virtuals to the actuals."[34] To Deleuze, the virtual and the actual both have a reality: "The virtual as virtual has a reality."[35] Félix Guattari describes the virtual as one of "four ontological functors"—the virtual, the actual, the real, and the possible.[36] In *Becoming Virtual,* Pierre Lévy also appeals to a model of evolution, yet with

the arrow in the other direction—away from the actual, toward the virtual. Arguing that the "virtual is by no means the opposite of the real," Lévy traces the "accelerated cultural transition" toward virtualization—virtual identities, virtual communities, virtual realities—"the very process of humanity's 'becoming other'—its heterogenesis."[37] In Lévy's "cartography of the virtual," the term "virtual" supplies what Deleuze, Baudrillard, and Virilio describe (in spatial terms) as derealization, disappearance, deterritorialization, and changes in the materiality of space.[38]

These uses of the term "virtual"—in the science of optics, in the philosophical discourse of Bergson and, later, Deleuze, Guattari, Lévy, and others—have proceeded in a separate discursive arena from the developing use of the term in information and computer science.[39] Computer terminology invokes "virtual" to refer to a digital object or experience without physical existence. Hence, computer discourse more exactly links the virtual with the effects of a constructed simulacrum, unhinged from a referent in the real. "Virtual memory" refers to the use of a hard drive to augment RAM.[40] In the computer lexicon, where terms already inhabit the realm of metaphor, "virtual" joins other connotatively laden terms like "memory" and "language."

As the above discussion illustrates, despite the assertions of those who equate virtuality with the changes wrought by digital technology in the early 1990s, the term long existed in the discourse of optics, and was an operable philosophical concept in the late nineteenth century. As Brian Massumi aptly puts it, "Nothing is more destructive for the thinking of the virtual than equating it with the digital. All arts and technologies envelop the virtual, in one way or another. Digital technologies in fact have a remarkably weak connection to the virtual, by virtue of the enormous power of their systemization of the possible."[41] While this may seem a simple point, it is surprising how many contemporary writers base their discourse about the "virtual" on the conflation of the digital with the virtual and who assume, in the blindness of the present, that all mediated reproductions—by virtue of their *re*-presentation—must be electronic or digitally reproduced.[42] These more recent uses have overtaken and obscured the previous meanings and implications of the virtual.[43] Perhaps understandably, scholars who take information theory rather than theories of visual representation as their source for a definition of "virtuality" routinely neglect the tradition of predigital forms of virtual representation. For N. Katherine Hayles, for example, "virtuality" is a term that arose in the historically specific context of post–World War II cybernetics, and its meaning is inseparable from the technologies of "information." Hayles defines "virtuality" as "the cultural perception that material objects are interpenetrated by information patterns."[44]

Seen in this way, Hayles's virtuality is technologically determined, dependent upon the machinic dematerialization of "bodies" into information.[45]

Perhaps a polemic is needed: before the digital age, there was virtuality—painterly, photographic, cinematic, and televisual—and its aesthetics and visual systems cannot be reduced simply to information. There is a long prehistory to the "virtual" image: mirrors, paintings, images produced by the camera obscura, photographs, and moving-picture film all produce mediated representations in a "virtual" register. Once the term "virtual" is free from its enforced association with the "digital," it can more accurately operate as a marker of an ontological, not a media-specific, property.

We also need to disentangle the term "virtual" from its associations with the rhetoric of an immersive—and hence unframed—"virtual reality." In a recent study, *Virtual Art: From Illusion to Immersion* (2003), Oliver Grau aims to expand art historical analysis to include the spaces and experiences that intend to "seal off the observer from external visual impressions." Grau's history of immersive "spaces of illusion"—the panorama, *cinéorama,* stereoscope, Sensorama, and 3-D IMAX—describes visual systems that supply a totality of image space, a 360-degree space of illusion with an infinite number of perspectives, not fixed but dynamic.[46] But Grau makes a clear distinction between such immersive works and the representational strategies and traditions that otherwise are concerned with the frame. Framed images organize and structure perception and cognition in a very different way.[47] As the cinema screen, and later the television "set," became a framed delivery system for virtual images, the screen began to rely on an observer on the "outside," not the "inside." Once the "virtual" is separated from its reflexive association with immersive "realities," we can also account for the range of "virtual" images (still or moving) that are found in frames—paintings, photographs, images produced by a camera obscura, images projected by the magic lantern, and the subsequent moving-image media of film and television.[48]

For the purposes of this study, then, the term "virtual" serves to distinguish between any representation or appearance (whether optically, technologically, or artisanally produced) that appears "functionally or effectively *but not formally*" of the same materiality as what it represents. Virtual images have a materiality and a reality but of a different kind, a second-order materiality, liminally immaterial. The terms "original" and "copy" will not apply here, because the virtuality of the image does not imply direct mimesis, but a transfer—more like metaphor—from one plane of meaning and appearance to another.

A crucial component of my argument—that the cinematic, television, and computer screens have become substitutes for the architectural window—relies

on the virtuality of representational images. A portion of this argument is metaphoric: the window has become a metaphor for the screen. But a portion is also literal: the screen has become an actual substitute for the window. While my argument does not attribute causality, the coincidence of these changes is marked: the architectural role of the window changed alongside the development of its virtual analogs. Hence the "virtual" in my construction "virtual window" suggests both a metaphoric window and an actual window with a virtual view.

And the use of metaphor itself takes us into the realm of the virtual.

VISUAL METAPHORS AND REVERSE EKPHRASIS

Metaphors are proxies, aliases. As a rhetorical trope, metaphor relies on the substitution of one thing for another, a transfer of properties from the plane of the literal to the plane of the figurative.[49] Metaphors themselves are virtual; they reside in the immateriality of language, yet they refer to the material world. A *visual* metaphor functions in a complex circuit of rhetorical exchange and substitution: as a metaphor, it operates first as a language-based analogy for a literal object (as metaphor); as a visual metaphor, it relies on the description of a visual object rendered in words (ekphrasis).[50]

In order to unravel some dominant assumptions about Alberti's window metaphor, we need to examine the slippage of meaning occasioned by metaphor itself. Alberti invokes the image of the window as an instructive substitute for the rectangular frame of the painting. As a visual metaphor, the window functions to reinscribe its image onto another image, the painting. The relation of images in this circuit is bidirectional: the window is like a painting (it frames an opening onto the world) and the painting is like a window (as a technique to construct perspective, the painter should frame the view). But, I will argue, Alberti used the window predominately as a metaphor for the frame—the relation of a fixed viewer to a framed view—and not as a "transparent" "window on the world," as has been suggested widely by art historians and media theorists. Its frame was to be used to position the viewer in relation to its perspectival construction of space. Although Alberti's metaphor conflates the literal window with its figurative aspects, the architectural window and the painting developed separately as registers of constructed vision, separate worldviews but with similar frames.[51] Alberti may have meant to use the window metaphor as an instructional device and not as a philosophical paradigm, and yet, as a metaphoric figure, it performs a coy slippage. It is important to "out" the hidden rhetoric of metaphor because it is here, in the sliding signifiers of language, that they perform their sly discursive tricks: metaphors construct our cultural realities.

Many of the key terms in this book—window, perspective, frame, screen, architecture—operate in both metaphoric and literal registers, and their meanings frequently slip between the dual functions of philosophical paradigm and representational device. Here, to serve as a brief prologmenon to the necessity of unpacking the use of metaphor in discourses about painting, architecture, and the frame, I want to turn to a section of Jacques Derrida's densely metaphoric *The Truth in Painting* (1978). Deeply nested in this text is a compelling polemic.

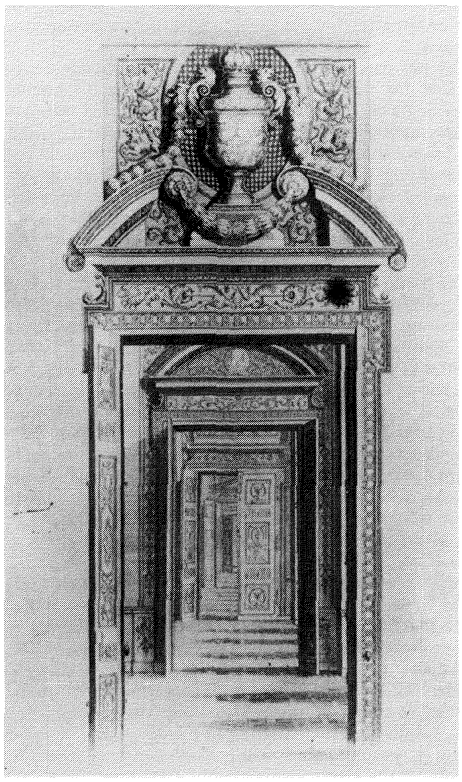
In *The Truth in Painting,* Derrida describes the *parergon* (*par-*, around; *ergon,* the work), the boundaries or limits of a work of art. Philosophers from Plato to Hegel, Kant, Husserl, and Heidegger debated the limits of the intrinsic and extrinsic, the inside and outside of the art object. In Derrida's discussion, the *parergon* is a Möbius-like boundary—a frame marking what is inside the work but, paradoxically, demarcating its outside in order to constitute what it contains.[52] To interrogate this "discourse on the frame,"[53] Derrida offers his discussion of the *parergon* as a nested commentary on Kant's *Third Critique,* a *mise en abyme* of frames:

> *Parerga* have a thickness, a surface which separates them not only (as Kant would have it) from the integral inside, from the body proper of the *ergon,* but also from the outside, from the wall on which the painting is hung, from the space in which statue or column is erected, then, step by step, from the whole field of historical, economic, political inscription in which the drive to signature is produced. . . . *No "theory," no "practice," no "theoretical practice" can intervene effectively in this field if it does not weigh up and bear on the frame, which is the decisive structure of what is at stake,* the invisible limit to (between) the interiority of meaning (put under shelter by the whole hermeneuticist, semioticist, phenomenologicalist, and formalist tradition) and (to) all the empiricisms of the extrinsic which, incapable of either seeing or reading, miss the question completely.[54]

In this passage, Derrida zooms out—from the frame to the wall to the architectural space that vaults itself around the wall, to the historical, economic, and political context of the work. His fiery assertion that "no theory, no practice, no theoretical practice can intervene effectively in this field if it does not weigh up and bear on the frame" forms a justification for this study. The everyday frames through which we see things—the "material" frames of movie screens, television sets, computer screens, car windshields—provide compelling evidence of

the dominance of the frame and its visual system. A study of the frame itself ("the decisive structure of what is at stake") will tell us more than a study of the intrinsic and extrinsic meanings of what the frame contains.[55]

But it is also worth investigating the role of metaphor here. Derrida's interrogation of the metaphysics of the frame relies on a metaphoric claim: a metaphysician is a "good architect," and "philosophy is an art of architecture."[56] Philosophers have had, as Mark Wigley details, a lengthy history of reliance on the metaphor of architecture.[57] One of the plates that accompanies the above-quoted section of *The Truth in Painting* is an engraving of a doorway, an ornate portal with Louis XIV-style ornamentation on its lintels and frames. Inside the doorway is another door, and inside that door another, and inside that another, as they recede inward in *mise en abyme.*[58] The illustration here forms a visual analog to Derrida's discussion of the Kantian *Critique,* a philosophical text which itself embeds its remarks on the *parergon* inside many other frames and which Derrida surrounds with his own commentary.[59] The image of this nested doorway, embedded in a text full of metaphors and wordplay, forms its own metaphoric relation to the text, but in a visual register, a sort of reverse ekphrasis—a pictorial representation of a textual *parergon.*[60]



I.1 *Encadrement de porte,* plate from Jacques Derrida, *La vérité en peinture* (Paris: Flammarion, 1978).

The metaphysician-as-architect may rely on one register of metaphor—invoking tectonic structures and architectural forms as discursive figures for the immaterialities of thought—but the *image* of the doorway, a material architectural figure, operates in another register of metaphoric translation.[61] In the Derridean example above, the *parergon* conducts a metaphoric transfer from the frame of a painting (literal) to the framed structure of a philosophical argument (figurative). While Derrida's text is densely metaphoric, and its transfers and references complexly nested, once the visual image of the framed doorway is introduced, the transfer that had been conducted in the pure immateriality of language has found, in the image, a figurative and literal referent.

Derrida's discussion of the *parergon* offers a model for the disciplinary and philosophical boundaries of this study *and* of its object. A visual metaphor, such as the window, functions in a complex circuit of rhetorical exchange and substitution. Because metaphors are transfer devices, conduits for meaning from one frame of reference to another, metaphor may itself offer a discourse

of translation between the traditions, debates, and objects of study of separate disciplinary domains.[62] As new media are introduced, metaphor functions as accommodation, wrapping the newly strange in the familiar language of the past. Architecture, long a metaphor for philosophy, was also adopted as an early model for software design. In the culture of interface, we live in the realm of metaphor. An interrogation of the cultural valences of metaphor may build "bridges" (another metaphor) between the disciplines of philosophy, art history, film studies, and new media studies.

METAPHORS FOR THE SCREEN

As a metaphor for the screen, the window proposes transparency, a variable size, and the framed delimitation of a view. In this regard, it is worth comparing at the outset another metaphor for the screen—one well trodden in contemporary Lacanian-inflected film theories—the mirror.[63] The mirror's opacity, reflected light, and inverse image suggest a visual system quite opposed to that of the window's transparency, transmitted light, and seemingly unmediated image.

These two competing visual systems are at the very root of perspectival theory: Alberti's window and Brunelleschi's mirror. In a 1425 experiment, Filippo Brunelleschi crafted an apparatus designed to demonstrate the correlation between perspectival painting and a mirrored image of the Baptistry of San Giovanni in Florence, as if the painting of the Baptistry were comparable to the flat plane of its mirror reflection rather than to the three-dimensional view of the building itself. Biographer Antonio di Tucci Manetti described Brunelleschi's experiment in a 1475 account: "the spectator felt he saw the actual scene when he looked at the painting."[64] (A key discrepancy between the mirror and the painting will be discussed later: movement—of the wind and clouds—was visible on the mirrored surface but not on the painted one.) Hubert Damisch writes at length about the Brunelleschi experiment that forms the basis of our historical understanding of perspective, and leaves open the question of whether the mirror was a tool for constructing perspective or just for the demonstration of its mimetic effect.[65] But either way, the mirror served as a verifier of the "truth" of perspective. In Damisch's historiography, the Brunelleschi experiment enacts the "mirror stage of painting," as if painting formed its identity in relation to the flat planes of a mirror image. The metaphor of the mirror—producing substitutive, deceptive, illusory vision—and the metaphor of the window—producing direct, veridical, unmediated vision—imply very different epistemological consequences.

In the context of film theory, the mirror and the window have quite separate discursive histories.[66] The following synoptic survey draws upon the meta-

phors in contemporary film theoretical accounts. In her 1992 book *The Address of the Eye: A Phenomenology of the Film Experience,* Vivian Sobchack isolates three metaphors that have dominated and delimited film theory: picture frame, window, and mirror.[67] In her account, Sobchack adopts the familiar binary opposition between formalism and realism, and finds the metaphors of frame and window as "emblematic" of each.[68] In this way, the frame and the window not only "represent the opposing poles of classical film theory," but the two metaphors also neatly illustrate the theoretical opposition between "perception" and "expression," the very poles that a phenomenological approach will resolve as a "systematic exchange." The mirror metaphor, as a third term, "represents the synthetic conflation of perception and expression that characterizes most contemporary film theory."[69] Here it should be noted that Sobchack uses each metaphor as "emblematic" of a theoretical position but does not suggest (or supply examples which might indicate) that these theories use the metaphors directly. Yet the crux of Sobchack's critique of classical and contemporary film theory is located in the "non-dynamic activity of viewing" implied by each of these metaphors: "What is interesting to note is that all three metaphors *relate directly to the screen rectangle and to the film as static viewed object,* and only indirectly to the dynamic activity of viewing that is engaged in by both the film and the spectator, each *as viewing subjects.*"[70] Here, it is precisely Sobchack's non-metaphoric use of the frame that becomes important for her phenomenological discussion of the viewing subject. Sobchack asserts that the geometric rectangularity of the film frame "is invisible to the seeing that is the film."[71] The frame "functions for the film as the field of our bodies does for us."[72] The frame is, in Sobchack's account, an "organ of perception." Yet its "lived logic" is one of duping the body's senses in the act of viewing. The frame is not a metaphor here; it is a component of an embodied visual field both literal and phenomenal.[73]

Other writers have used the metaphor of the window to describe cinematic spectatorship. In *Technology as Symptom and Dream* (1989), Robert D. Romanyshyn offers an account of the "condition of the window" as a constituent component of film spectatorship. Instead of assuming the window's unmediated transparency, Romanyshyn's window relies on assumptions about its mediated separation of inside and outside: "The condition of the window implies a *boundary* between the perceiver and the perceived. It establishes as a condition for perception a formal *separation* between a subject who sees the world and the world that is seen, and in so doing it sets the stage, as it were, for that retreat or withdrawal of the self from the world which characterizes the dawn of the modern age. Ensconced behind the window the self becomes an observing *subject,* a *spectator,* as against a world which becomes a *spectacle,* an *object* of vision."[74]

While Romanyshyn's characterization of the boundary separation between the "subject who sees the world and the world that is seen" seems to invoke Heidegger's philosophical discourse of the setting-forth (*Vorstellen*) of the "world picture," he is less concerned with the philosophical consequences produced by modern technology and relies, instead, on accounts of the social effects of technological change in Marshall McLuhan, Harold Innis, Walter Ong, and Donald Lowe. Romanyshyn invokes the metaphor of the window in order to emphasize the removed position of the viewer, in "retreat" and "withdrawal."[75]

To philosopher Stanley Cavell, the cinema screen serves as a metaphoric barrier, like Romanyshyn's boundary window: "A screen is a barrier. What does the silver screen screen? It screens me from the world it holds—that is, makes me invisible. And it screens that world from me—that is, screens its existence from me."[76] Cavell turns the screen on its linguistic side: its noun form is turned into a verb: "what does the silver screen *screen*?" As an action verb, the screen renders the spectator invisible, keeps the spectator from the world it holds in its frame.

The screen—as a filtering or distorting device—is frequently used as a metaphor for the function of the film screen itself. In this way, the English translation of the title of Freud's 1899 paper "Über Deckerinnerungen" as "Screen Memories" may be responsible for the common conflation of screen as mediating device and as a surface for representation.[77] Freud's short paper described how an early memory could serve as a "screen" for a later event. But the German term that Freud used—*Deckerinnerungen*—emphasizes the manner in which an early memory "covers" or "blankets" rather than filters or distorts. (The compound noun *Deckerinnerung* includes the root for memory [*Erinnerung*] and for cover or blanket [*Decke*].) Strachey's translation "screen memories" carries the potential double meaning of screen as both a filtering/distorting device and as the material surface of projection. In 1899, Freud certainly was not referring to a film screen or even to the screens of magic lantern projection. But in the slippage of metaphor, the double-entendre forms the basis for readings of how films, seen on the screen, "screen" memories.[78]

While psychoanalyst Jacques Lacan invoked the metaphor of the mirror as a model for the visual scenario of identity formation, his most elaborate theorization of the constitutive scenario of vision relies on the metaphor of the screen (*écran*).[79] In Lacan's interlaced triangular diagrams of vision in *Le séminaire*, the screen figures as a metaphor for intersubjective mediation, the relation between the subject and the "gaze" (*regard*).[80] In *The Threshold of the Visible World* (1996), Kaja Silverman deploys Lacan's use of screen—as both a verb and noun—to describe the mediation between the spectator and spectacle, the subject and representation.[81] Although Silverman proposes "that the screen is the

site at which social and historical difference enters the field of vision," she means "the screen" in the Lacanian sense as "category" or metaphor for intersubjective mediation and *not* as a material surface for the projection of moving images or for the screenic display of televisual images.[82] Screens interpose themselves between the subject and the gaze, but the "shifting social or historical variability" to which Silverman refers remains in an imaginary psychic register and does not account for the material registers of the frame, or the complicated multiplicity seen within its boundaries. While engaged in a call to meet discursive formation with material practice, Silverman retains the metaphoric use of the terms "camera" and "screen" and resists describing cinematic, televisual, or computer interfaces as material practices framing the view.[83]

The metaphors of windows, mirrors, frames, screens fall into a slippery discursive tumble of synecdoche and displacement. With all of these metaphoric figures it will be important to underline the dynamic interaction between the place of the viewing subject and the framed view. As images move across the screens of cinema, television, and the computer, the viewer's immobility meets a paradoxical and compensatory mobility when moving images are seen within a frame. As screens contain other screens in a nested *mise en abyme* of multiple frames, as quattrocento perspective is both fractured and multiplied, the "virtual window" opens onto a new logic of visuality, a time-architecture, framed and virtual, on a screen.

THE WINDOW AND THE BOOK

> *[T]he printed book has not simply been played out, but rather this unique medium was what made its own high-technological outdoing possible in the first place.*
>
> —Friedrich Kittler, "Perspective and the Book"

In a recent essay, "Perspective and the Book," German media scholar Friedrich Kittler argues that the very technologies that led to the book have also led to its undoing.[84] Kittler constructs a teleology beginning with two devices from the Renaissance that, he argues, have lead to the contemporary "end" of the book: Leon Battista Alberti's use of the camera obscura for linear-perspective drawing, and Johannes Gutenberg's invention of the printing press with movable type. For Kittler, these two devices illustrate the Renaissance roots of technical reproducibility, respectively, of image and text. Each apparatus was able to produce copies without the interference of the human hand. Kittler uses this historically confluent "media-union" between printing and linear-perspective drawing to launch a historical trajectory that hurtles headlong toward computer-

assisted writing and reading and the inevitable demise of the printed book. "From the *camera obscura* have come the photographic camera and the computer screen," he writes, "from movable type, movable electrons in silicon chips."[85] While Kittler's argument is a forceful polemic linking the technologies of the text and the image and noting the fatal intertwining of their destinies, the leap between the camera obscura, the photographic camera, and the computer screen is an enormous one, one that elides details of technology and history. How do we account for the complex set of forces that have led to the computer display screen and its referential relation to the archives of image and text and databases of knowledge?

Walter Benjamin may have had some inkling of the book's eventual demise when he wrote, in "One-Way Street" (1928): "Now everything indicates that the book in [its] traditional form is nearing its end."[86] Benjamin noted the postural change from the "archaic stillness" of the book to the "dictatorial perpendicular" of the newspaper, the advertisement, and the film: "The newspaper is read more in the vertical than in the horizontal plane, while film and advertisement force the printed word entirely into the *dictatorial perpendicular.* And before a child of our time finds his way clear to opening a book, his eyes have been exposed to such a blizzard of changing, colourful, conflicting letters that the chances of his penetrating the archaic stillness of the book are slight."[87] Benjamin's complaints about book writing and the changing habits of reading now seem uncannily prescient, as if he had already imagined the mechanical potentials and pitfalls of computer writing and reading. The "Arcades Project" now appears as a precursor to the nonlinear logic of computer writing and hypertext.[88]

The computer screen is both a "page" and a "window," at once opaque and transparent. It commands a new posture for the practice of writing and reading—one that requires looking into the page as if it were the frame of a window. The computer screen adds new depth to the perpendicular surface. Its overlay of "windows"—open to different applications for word-processing, Web browsing, emailing, downloading—transforms the screen surface into a page with a deep virtual reach to archives and databases, indexed and accessible with barely the stroke of a finger.[89]

This is a book about windows, their virtual substitutes, and the fractured multiplicity of the multiple "windowed" screen. It was written while looking into a screen fractured into many windows—overlapping and simultaneous applications, some hermetically sealed, some wired to the outside. And until there is a hyperlinked electronic edition, it will be read while held with the "archaic stillness" of a book.