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The Digital Panorama and Cinemascapes

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Among the new kinds of media works that are being created with the invention of digital arts software are interactive panoramas and cinemascapes. In these works, users navigate environments that appear visually contiguous (like painted and photographic panoramas) or both spatially and temporally continuous (like moving long takes and cinematic pans). What is different is that these digital environments include layered and composited elements which often disrupt the authoritative stance of objectivity that contiguous and continuous representation is commonly used to represent.

For example, the expression of verisimilitude that is established through fixed and naturalistic relations of scale and position in many documentary photographic panoramas is disrupted when elements from outside the temporal-spatial frame of the photographic moment are layered upon the image. In a naturalistic work, elements in the mise-en-scène will conform to expectations (largely shaped by cultural and aesthetic conventions) that the depicted elements are of common origin (they might actually have been seen together in a particular place and time) and that they are painted in a way that maintains certain formal and spatial relations, such as those of painterly style and perspective. Similar conventions apply in nonfiction work, the primary difference being the degree of legitimacy given to technological mediation (and this degree varies). A documentary photograph may constitute an authoritative record of how elements were arranged as seen from a certain perspective at a certain moment, but people who were there and saw the scene from other positions may remember the scene differently. Works, such as John Rechy's *Mysteries and Desire*, discussed later in this essay, use digital panoramic environments to challenge naturalistic conventions and the relationships (e.g.,

part-to-whole, observer-to-object) that they frequently reinforce. Once dialectically opposed characteristics, such as continuity/contiguity and montage or exposition and narrative, now coexist. They are no longer mutually exclusive; the compositing and layering of materials on a continuous or contiguous environment enables the simultaneous presentation of both syntagmatic and paradigmatic elements. Multimedia is also multimodal.

The impact is significant. As is true with web interactivity in general, scrolling digital environments like those discussed in this essay bridge critical and creative modes of representation. Exposition, poetry, and narrative coexist and share the screen environment with other expressive forms, like music, video, graphics, and games. Cinematic and photographic viewing experiences are equally readerly ones. Passive "viewers" become active "users." The differences between researcher, artist, and user may also dissolve. The researcher and artist may use the same or similar programs to gather and compose their materials. The intended audience may likewise view such works with the same programs, and may even respond to or reconfigure what the artist or researcher has produced.

In a number of new works users may follow—or participate in—the process of building propositions, arguments, or expression. This encourages a critical and methodological shift from product to praxis: theory and practice merge in (the potentially ongoing) process of creative activity. By following what choices the researcher-artist makes, the user is actively drawn to consider alternatives. In some cases these alternatives may even be represented through alternate routes through the same materials.

Pans and Panoramas

Robert Baker patented the concept of panoramic paintings in 1787. His groundbreaking works include *The Panorama of Edinburgh* (1788), which he presented in his home, *London from the Roof of Albion Mills* (1792), which was shown in a rented space, *View of the Fleet at Spithead* (1796), which is shown in a small split level rotunda that Baker built for the purpose in Leicester Square, London, and the highly successful *Battle of Abonlair* (1798), which also was shown there. The success of these works led to his receiving international invitations and also spurred a flurry of copycat projects initiated by other artists and entrepreneurs. The popularity of panoramas endured, in waves, for a century, until the rise of cinema in the 1890s (Oettermann 1997, 6). Many of these nineteenth-century painted panoramas depicted exotic sites and battle scenes, and the

majority were created for display in rotundas. Viewers stood on platforms in the center of a circular environment, from which point they enjoyed unobstructed 360-degree views of the work surrounding them. It is frequently suggested that this panoptic point of view corresponds with a desire for control—a control characterized by omniscience, sight, and separation from the object of one's gaze. Art historian Bernard Comment writes:

> The invention of the panorama was a response to a particularly strong nineteenth-century need—for absolute dominance. It gave individuals the happy feeling that the world was organized around them and by them, yet this was a world from which they were also separated and protected, for they were seeing it from a distance. (Comment 1999, 19)

However, one might ask whether the desire for control does not simultaneously belie a certain loss of control, ceded to the technological apparatus of the rapidly industrializing societies where the form gained popularity. With a panorama, the viewer remains merely a passive spectator to a world of attractions that encompasses her (and extracts her labor and money).

The term *panorama* is derived from the Greek *pan*, "all," and *horama*, "view"; a 360-degree view offers spectators an impression of wholeness. Just as in viewing an actual landscape, in looking at a panorama the spectator sees how each element is connected to the next. The viewer has the impression of seeing everything—of being able to grasp the image as a whole. Paradoxically, the inverse may be more accurate. The panorama offers the viewers an illusion of commanding a total view of a moment; actually, it is the image that encompasses the viewer in the exotic locales of its form (the panoramic rotunda) and of its content (foreign lands, ancients worlds, battlefields). It is impossible for a spectator to grasp a panorama in its entirety; it offers more than a person with two eyes can see at a single glance. As one turns, a viewer must remember what can no longer be seen while looking in some other direction. Both in actuality and in this medium, the impression of unity is provided by a spatial and temporal seamlessness in which each element is both defined and confined in its relationship to the next element in the image and in its relationship to the view as a whole. The illusion is maintained if one does not see a break in the contiguity of the image or in the temporal continuity of the viewing experience. This illusion of seamlessness is one of the characteristics of panoramas that new media artists have been exploring, as, for example, by showing how even the

same scrolling scenes can lead in differing directions or by including layered materials that evoke differing temporal modes.

In his essay "Walking in the City," Michel de Certeau contrasts the experience of admiring a 360-degree view of New York from the top of a skyscraper with the experience of walking in the streets. His description of the view from the skyscraper is much like that of looking at a painted panorama. The viewer exalts in the opportunity to grasp a sense of the whole while also being separated from it:

> To be lifted to the summit of the World Trade Center is to be lifted out of the city's grasp. One's body is no longer . . . possessed, whether as a player or played, by the rumble of so many differences and by the nervousness of New York traffic. . . . When one goes up there, he leaves behind the mass that carries off and mixes up in itself any identity of authors or spectators. . . . It transforms the bewitching world by which one was "possessed" into a text that lies before one's eyes. It allows one to read it, to be a solar Eye, looking down like a god. The exaltation of a scopic and gnostic drive: the fiction of knowledge is related to this lust to be a viewpoint and nothing more. (1984, 91–92)

In the 360-degree painted panorama, the viewer is similarly protected and contained by the remote viewpoint. Standing at the axis of a circular view, the spectator is omniscient and also invisible; the spectator looks out into a world that does not look back.

What both the panorama and the view from the skyscraper share is contiguity—the seamlessness that provides an illusion of wholeness. The unifying elements of a panorama are spatial and provide a structure for interpreting the elements that comprise the scene. The same is true of the overview of the city from a skyscraper: the flow of events is contained within a spatial order. According to Certeau, the cityscape is itself a text. This kind of text is only deciphered from afar, not unlike the way a panorama is deciphered. However, unlike a conventional panorama, with the city view, one then descends the tower and enters the city at street level. There, up close, walking in the streets, experience is fragmented. In walking along streets, turning this way or that, one selects routes that one cannot simultaneously see from above. The viewer becomes a user. Her experience is shaped by unfolding events, unpredictable occurrences, interruptions, and spontaneous acts as well as by choices she makes. The experience of walking in the streets is an active kind of montage.

Like the panorama, the illusion of cinematic long takes and pans are based on continuity and contiguity; the integrity of the image is not interrupted. Early naturalistic recordings, such as the films of the Lumière brothers, presented single takes, constructing an experience of verisimilitude though this expression of temporal continuity—a forever reviewable slice of time—and contiguity, although the experience of the integrity of contiguous elements becomes limited by the frame. Like panoramas, cinematic long takes create a sense of omniscience; the chance to monitor what is going on is never interrupted, as is also the case, for example, with security cameras. The paradox of seeing and not seeing the whole is exaggerated all the more in the cinematic pan. While the seamlessness of space and time suggests that the world beyond the frame remains fully intact, verification is frustrated by the limits of the frame line; the spectator must wait for the technology to deliver the confirmation of wholeness that is established by a rhetorical convention. Technology determines how the image goes around and not the viewer.

It is through its representation of time that film in general, and long takes and pans in particular, augment the qualities of verisimilitude. The evocation of verisimilitude was something that panorama artists struggled with during the latter part of the nineteenth century. They added lighting effects, smells, wax statues, platforms that rocked to simulate boat rides, and reenactments (particularly in battleground panoramas) (Schwartz 1998). But the more artists tried to replicate actuality, the more they also accentuated the differences between the natural world and their constructed ones.[1] In a response in *La Nature* (June 15, 1889) to a Transatlantic Company panorama about an ocean voyage, one critic characteristically wrote, "What the illusion lacks is a light breeze, floating pavilions, the sound of the lapping of waves" (Comment 1999, 105). The disinterested, omniscient viewpoint of the panorama also imposes a separation of time between the viewer, turning and choosing what to look at, and the scene on view. In this regard, the painted panorama expresses an absence of time. It is this absence that is magnified by the awkward attempts to include elements like wind and waves that exist in, mark, and measure time. Film, which draws viewers into its own time conditions, satisfies some of these limits of verisimilitude but introduces others (e.g., linearity).

Film technology imposes an authoritative organizational structure; the time-base of the technology imposes a constant (the frame-rate) by which the content (the images) is mediated. This is very much like the authority that is constructed through other technological institutions of time, such as the universal time system, train schedules, mechanized assembly lines, and

workplace timecards. With film, the rate of the flicker of images is essentially fixed. Through montage, ideas in one shot are connected to those of another. Each cut is a rhetorical device; it proposes an idea through an editing strategy (continuity, association, dialectics, etc.). The compositional and montage choices have much in common with the poetic and rhetorical choices of writing; in digital media these parallel systems begin to come into contact with each other.[2]

In his discussion of walking in the city, Certeau suggests that the skyscraper overview offers a rhetorical proposition: the city as a text. The singular and unified view of actuality from above contrasts with the fragmented one in the streets. Certeau continues his linguistic analogy: the view is structured and unchanging, like a fixed text, whereas walking, which is fluid, fragmented, and can go in any direction at any moment, is like speech. The former (viewing the city, reading the text) is abstract and objective, the latter (walking, speaking) immediate and subjective. In the former, the expression of actuality is visual and static; it is an image that is singular in form and more or less constant. In the latter it is temporal and grows out of a web of experiences and their significations, the meanings of which are continually being reevaluated. In comparing these dialectics of overview/walking and grammar/speech, Certeau argues that the viewpoint from on top of the high-rise provides an abstract concept that is unable to account for the diverse forms of expression and time encountered in walking. Walking is a kind of active montage by which one gathers experiences. In walking and talking, movement is fluid:

> If it is true that forests of gestures are manifest in the streets, their movement cannot be captured in a picture, nor can the meaning of their moments be circumscribed in a text. . . . Their rhetorical transplantation . . . constitutes a "wandering of the semantic" produced by masses that make some parts of the city disappear and exaggerate others, distorting it, fragmenting it, and diverting it from its immobile order. (1984, 102–3)

To extend Certeau's analogy, readers and walkers are *users*, navigating texts that require actions, choice making, and perhaps responses. Perhaps, like the city, the screen space is an environment to be navigated, a landscape in which to walk. Digital panoramas maximize this spatial metaphor by extending the parameters of the screen environment and offer visual

platforms in which continuous or contiguous elements may coexist with materials that are fragmented or montaged. Thus, as the borders between reading and viewing break down, so do those between navigated and linearly cinematic forms of reception. In my own work, panoramic methods of production have led to the creation of what I term *cinemascapes*: navigable visual environments of cinematic materials. Panoramas and cinemascapes present users with seemingly contiguous (and perhaps continuous) representations, and in many cases users interact with fragments contained in those environments.

These elements—temporally continuous long takes, spatially contiguous pans or panoramas, montages, text, photos, and so forth—need not be exclusive. Through compositing, layering, and interactivity, new forms of cinematic panoramas are integrating panoramic and cinematic form, problematizing their conventional divisions and forcing a redefinition of their compositional languages. These interactive panoramic environments provide the opportunity for the kind of "wandering semantic" that Certeau describes, while at the same time they undermine his claims of representational boundaries. While no form may lay claim to being able to map and make visual the infinite and symbolic fields of subjective experience, these new forms for media do provide ways to draw multiple expressions of time and expression into a common space, disrupting boundaries of contiguity without destroying them.

Mysteries and Desire: Searching the Worlds of John Rechy

A number of works employ interactivity in panoramic environments to explore what is hidden in the details of the contiguous image—details that users must tease out through navigation, play, and deduction. One such work is *Mysteries and Desire: Searching the Worlds of John Rechy*. Designed in Macromedia Director using Quicktime Virtual Reality (QTVR) panoramas, the CD-ROM work is the result of a collaboration between Rechy and the artists of the Labyrinth Project at the Annenberg Center of Communication at the University of Southern California.

Mysteries and Desire is a kind of autobiography that makes use of interactive panoramic environments to present a series of interpretations of the author's life experiences, with particular attention to the symbols and conditions of being a gay writer in mid- to late-twentieth-century Los Angeles. A short introductory video loop links users to one of three sections, the themes

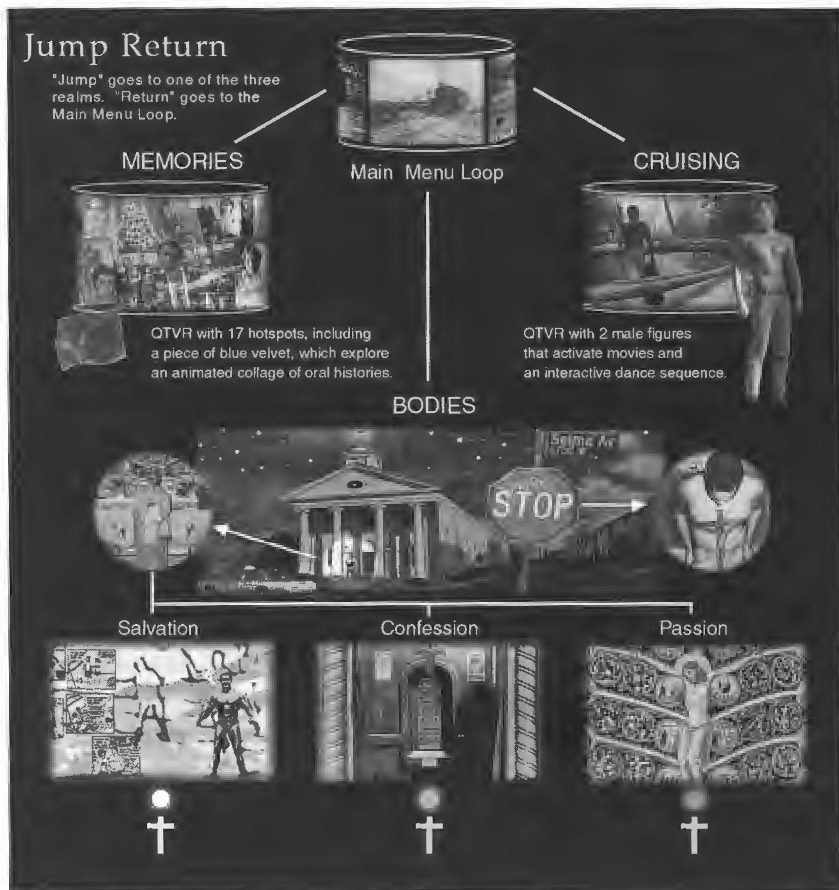


FIGURE 16. Excerpt from *Mysteries and Desire: Searching the Worlds of John Rechy*, a CD-ROM produced by Rechy and the Labyrinth Project at the Annenberg Center of Communication, University of Southern California (2002).

of which are "Memories," "Bodies," and "Cruising." In these sections, viewers navigate QTVR environments, choosing links that lead down interactive paths or into collections of materials. The participation required of the user to discover links in the panoramic environments is thematically important in a work about the concealed methods of expression in gay cultural life in an era of cultural oppression. Forms of expression represented in the project include exposition, interviews, audio of Rechy reading excerpts from his books, photographs, graffiti, stained glass, a comic strip, and dance, while locations include lonely paths in the woods, urban barrooms, back alleys, and church confessionals. In interacting with the work, users draw the activities into

light, employing mouse actions to trigger aesthetically compelling responses. Panoramic media provide the structural framework for each section.

The first section is a kind of scrapbook made up of photos that, when clicked, lead to narrated passages from Rechy's essays and fiction, interviews with people who have known the writer, and other biographic materials.

In the second section, users find themselves on a street corner in front of a church. One portal from this panoramic image leads into the church, where users discover interactive elements in the stained-glass windows and in the confessional; provocative graffiti blending gay and religious imagery is found in the alley behind the church, presumably a secret meeting place. A series of links leads users to a comic strip based on an advertisement for a body-building device. The comic shows a scrawny boy who has sand kicked in his face on the beach by a tough guy. The boy responds by purchasing weights and becoming a muscleman. Rechy offers viewers two ways of exploring the materials. One is an essay on the role of the muscleman in gay culture; the other is an animated photo sequence evocative of the visual iconography of the muscleman in the contexts of athleticism, power, and sexual desire. The choice of which route to follow is in the hands of the viewer, literally: the computer mouse is represented on the screen by a small iconic barbell. If the reader-viewer starts to lift the barbell and "work out," the reward is a kaleido-scope of evocative and sensual body transformations. If not, the reader-viewer listens to the exposition. In this way, a user learns how simple actions become a kind of language; using specific gestures at specific moments will yield spe-cial, surprising responses.

Thus, from within a panorama, viewers enter into layers of materials that evoke, as much as explain, Rechy's views of gay cultural conceptualizations of the body. The panoramic structure allows the author to bring diverse methods of interpretation together on a common platform. Among the resulting mes-sages offered by Rechy's work are that no single form of representation is good for all seasons, and that meaning is as much to be found in the movement between modes, costumes, performances, and personas as in any particular content-event.

The panoramic device also solves some presentational problems of work-ing with fragmented, linked materials. It provides a common framework in which elements of a theme or a moment may reside. The elements play to, and revolve about, the invisible axis at the center of any panorama—the user. But in contrast to the painted panorama, in this kind of work the user is in-vited to participate in the scenes and travel through their portals.

What we will have of what we are: something past . . .

What we will have of what we are: something past . . . is a multi-panorama online work written and developed by John Cayley in collaboration with Giles Perring and Douglas Cape.[3] At the top of the screen is a twenty-four-hour clock whose hour numbers are laid over day and night images of London taken from the top of Saint Paul's Cathedral. The user clicks on the clock to enter the work. The clock slowly turns, suggesting a chronological structure, and the user is dropped into a naturalistic scene—a panoramic photograph presented using QTVR—that is indeed determined by the time selected. Small pop-up windows announce each location and provide clues as to how to navigate the scene. For example, a user entering at 8 a.m. finds herself in Richard's Flat. Richard sits on his bed in a T-shirt and underwear, his hand on the telephone message machine. Clothes are scattered on the sofa. The explanatory text reads, "Richard has been missing Helen's calls, messages of mixed media will have been left, handwritten, beside him." The letter on the bed contains a link.

There is no beginning or end to the story; navigating in this manner, the user can drop into scenes in any order. Moreover, the structures of time as given by the clock and the location as established by the naturalistic panoramic photos are deceptive; users are trapped within circular narratives interlinked like magician's rings that connect, disconnect, and reconnect in time frames that differ depending on which character one is following. Parallel to the naturalistic, technologically determined structure is another subjective, achronological one, and the choice of using the cathedral to represent this is apt.

One of the unique features of Saint Paul's Cathedral is the Whispering Gallery, which runs around the interior of the dome. A whisper at any point along its wall is audible to a listener with her ear held to the wall at any other point in the gallery; due to the peculiar acoustics of the dome, however, words spoken normally do not carry in the same way. In the dome, time is mirrored across the circle; at any given point, one hears whispers from the opposite point.

In *What we will have of what we are: something past* . . ., such whispers are linked to dreamy, black-and-white imagery. The methods suggests that for each naturalistic and temporally specific color image there are corresponding and seemlingly timeless memory fragments—whispers that echo across a divide between inner mind and the outer worlds. The links that trigger these whispers and imagery are often media objects such as letters and phone mes-

FIGURE 17. Excerpt from *What we will have of what we are: something past . . .*, produced by John Cayley with Giles Perring and Douglas Cape (2003), http://www.z360.com/what.

sages that call attention to the absence of the sender. In these dreamlike sequences, body parts are severed, collaged, or superimposed over strange settings; faces meld or are stretched and squeezed into bizarre forms; eyes blink open and shut. The whispers evoke an ethereal subtext of the dreams and desires of the three characters who, in the naturalistic photos, are depicted performing mostly mundane activities in train stations, pubs, cafes, bridges, apartments, and other everyday London settings.

The naturalistic panoramas seem to promise temporal and narrative continuity, and at first the narrative seems tied to a simple linear chronology. Soon, however, one realizes that the chronological structure is artificial and misleading. Without disrupting the ongoing structure of technological time—as established by the ticking clock—Cayley is able also to represent aspects of subjective temporal experience. This is different from cinematic expressions of technological and subjective time in several ways. Users experience individual panoramas in their own time and not at a pace dictated by frame-rate; users determine the narrative order of the work and may or may not trigger particular elements. While the audiovisual layering is adapted from film, movement between parallel modes is more fluid in this work, if perhaps at the expense of the rhetorical power gained in film through dialectical, associative,

FIGURE 18. Excerpt from Tirtza Even and Brian Karl, *Counterface*.

and continuity editing—devices by which a filmmaker drives home ideas in the flow of action. Cayley's works demonstrate how layering and linking in panoramic form can allow the mediamaker to interconnect parallel temporal structures, at least within the design limitations of the finite cycles of the work itself.

Another example of using layered motion imagery to destabilize temporal continuity is Tirtza Even and Brian Karl's *Counterface*, in which a dark glass plane in a metal frame is mounted on a gyroscope-like double axis so that it can be rotated up and down as well as sideways. The primary (or outdoors) stream is a video pan that can be viewed right-to-left or left-to-right. While multiple exposures have been used in linear film since its earliest days, digital tools offer many more options for manipulating the time-image as a composite element; the resulting works have more in common with the layered (still) photographic montage popular in the 1910s and 1920s than with cinematic montage. Window slats provide mysterious points of entry and exit. Long takes recorded in the same place at different times are composited using masking techniques so that differing events are compressed into a single image causing individuals to seem to appear and disappear in midaction in seemingly continuous environments. The effect is haunting.

As with Cayley's work, the project uses new media tools to expand the experience of individual scenes and to present materials that are connected by topic but vary by mode. Here, users may rotate the glass to halt the pan and view action unfolding in the depth of the image, along the virtual z-axis. By turning the frame up or down on its x-axis, users trigger a parallel (indoor) sequence of interviews that can then be navigated by turning the

frame left or right. The gaps created by presenting concurrently accessible materials also evoke a sense of absence, in terms of what seems to be erased from the documented surface, and the potential for concealed elements to reemerge.

From *Something That Happened Only Once* to *The Unknown Territories*

Something That Happened Only Once is an animated photographic panorama for projection on one or two walls, and *The Unknown Territories* is a series of spatially organized interactive cinemascapes combining video clips, pop-up interactive panoramic photographs, and other materials over contiguous, scrolling environments.[4] Both explore questions of contiguity and montage. Playing on the conventions of the cinematic pan and long take, the time-based structure in a work like *Something That Happened Only Once* emphasizes questions of expectation and temporal unity, whereas the interactive scrolling environments of *The Unknown Territories* draw attention to questions of praxis and choice making.

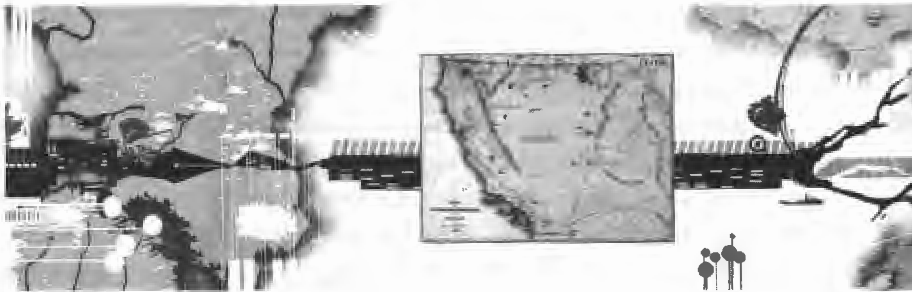
Something That Happened Only Once slowly revolves, like a cinematic pan. Each cycle takes about ten minutes, and in most presentations two different cycles are shown. Some installations present these loops using dual projectors that connect along a single edge. The seamless panorama may at first appear to be a naturalistic or documentary representation of a busy plaza in Mexico City. The project was recorded around lunchtime in Coyocan Plaza, where about a dozen actors—provocateurs of a sort—were scattered among the crowd, some performing roles for the camera and others provoking responses from the public. The actions are photographed. These photographs are then layered and composited so as to create what at first seems to be a seamless panorama, and elements are animated so that some characters may appear to move. The audio is also layered; found sounds mix with fragments of text that are spoken and sung. The audio may play in stereo or surround-sound.

A conventional panorama is not one moment but a collection of moments seamlessly combined. The layered elements in *Something That Happened Only Once* float freely at rates shaped by their own narrative trajectories. This layering separates individual actions (and the characters who perform them) from the singular, authoritative order of time implied by the technological apparatus of the pan. As the image turns, the user will recognize that the second time around is *not* the same as the first. The structure

FIGURE 19. Excerpt from *Something That Happened Only Once,* a multimedia installation by Roderick Coover (2007).

of the cycles resembles a Möbius strip. Events that begin in the first cycle may be shown to develop in a second one, while those that would seem to begin in the latter cycle may conclude in the former, such that there is no beginning. Or, rather, there are many beginnings, and each is determined by the actions of individuals rather than by the seamless backdrop. The effect of this is that users cannot rely on the temporal apparatus of the recording device as a means of making the elements of the space conform to a single narrative. Instead users must identify characters and follow their narrative trajectories through a temporally destabilized space.

Although contrary to many conventions of panoramic representation, these strategies may be truer to natural processes of cognition than those of the conventional long take or pan. In looking at the world, attention jumps from one



action to another, glossing over areas that are bland. If the goals of the viewer change such that the details matter, otherwise ignored aspects of experience are then looked at closely (Goodman 1978). The slow pans used in works like *Something That Happened Only Once* accentuate this tension between sight and apparatus, because they draw attention to how the frame line becomes a marker of time; this experience is magnified when the work is played on two adjoining walls, spiraling in opposite directions from a common border.

To explore how interactivity may enhance understanding of these questions of representation and authority, I developed a series titled *Unknown Territories*, which includes the sections "Voyage into the Unknown" and "Canyonlands: Edward Abbey in the Great American Desert." Edited video sequences, interviews, archival images, uncut video long takes, photographs, and original text documents are layered and composited upon seamless illustrated scrolling environments. In scrolling through these panoramic environments, viewers build their own documentaries based on the unique paths they construct. The format is particularly well suited to documentary projects in that it allows makers to include supporting materials that, although exciting and valuable, might be cut from a linear work because they depart from the primary thread or are simply not cinematic.

An interactive documentary humanities project about how perceptions of place are shaped through writing and the arts, the series takes its name from the label applied to unmapped areas on early-nineteenth-century maps of the American Southwest. This project weaves together text, sound, and image from the works of explorers and geographers, developers, environmentalists, artists, and writers to ask how we come to know and imagine an "unknown territory." The format allows for the inclusion of maps, diaries, photos, draw-

FIGURE 20. Excerpt, with select video clips illuminated, from ***Unknown Territories,*** an online project by Roderick Coover (2010), http://www.unknownterritories.org.

ings, and other materials from such diverse fields as geography, cartography, ethnography, and history.

In one of the series' cinemascapes, a primary path is constructed through a series of seven long-take video sequences about the author Edward Abbey. Between these are clusters of video clips that include edited overviews of historical, cultural, and environmental issues of the period, as well as extensive interviews and archival recordings concerning topics such as western migration in the 1950s, the Cold War–era boom in uranium mining, the impact of large dam projects on development and growth, and the changing nature of the environmentalist movement in the 1960s and 1970s.

Users may follow a primary path that presents selections of materials in ways one might experience in watching a documentary film. However, the cinemascapes offer viewers something that a linear documentary cannot: choices. The spatial structure allows users to follow Abbey's texts as he responds to events unfolding around him. And it allows them to follow the mediamaker's choices and to create their own judgments through the paths they weave. The format has a loose analogy with film editing; laying clips along a terrain is not unlike the process of creating a *timeline*, only here the timeline is visible to viewers. Further, the clusters of materials that are collected en route are not unlike those one might have collected in *bins*, only now the bins contain more than just footage. While supporting materials are commonly included as separate tracks on DVDs, the alternative routes through these materials are fully integrated into the viewing experience, allowing users the flexibility to expand or limit the narrative, to choose among expository and poetic approaches to the documentary's primary topic and its offshoots. The footage that went into the video clips is also included in its original form, and long takes of interviews supplement the edited sound bites.

The spatial structure of this and other cinemascapes, by letting users select a particular set of clips and supporting materials, offers them the means to follow how arguments are built out of experiences and may be constructed with poetry and visual imagery as well as through exposition. If they select to follow alternative paths through the data, then they will find themselves working through many of the same issues the mediamaker did. This shifts the user from being a critic of a fixed product to a participant-analyst in a process. Now implicated as a choice maker, the user engages both in an analysis of the mediamaker's path-making decisions and in self-analysis: what has she learned in actively navigating this environment, and toward what new questions do her chosen paths lead?

Conclusions and Discussions

The digital theorist Lev Manovich has been a proponent of the idea that uses of new media tools are giving rise to a new, hybrid language—a way of communicating that includes both prior methods of expression and new ones (Manovich 2002). In writing about the impact of design software like Adobe After Effects on how images are edited and how they are used to communicate ideas, he writes:

> The working method is neither animation nor graphic design nor cinematography, even though it draws from all these areas. It is a new way of making image media. Similarly, the visual language is also different from earlier languages of moving images. (Manovich 2006, 5)

Whether or not it fully constitutes a language, digital media have unique argumentative and expressive characteristics: a digital rhetoric and poetics. Layers, links, paths, and multimodal juxtapositions impact how one idea, word, or image might lead to another, and these are only a few of the mechanisms that shape invention and expression.

The examples in this essay explore representations that are spatially and visually cohesive but temporally multivalent. Questions of subjectivity and narrative choice raised by these panoramic works are also explored in game design and in works for immersive environments, such as CAVEs (Cave Automatic Virtual Environments).

The rhetoric and poetics of the new media reposition old media—holding their characteristics in a new light. What had seemed to be fundamental characteristics of old media, such as the spatial contiguity of panoramas or the temporal constant of film projection, are pulled apart, juxtaposed, and recomposed in new and hybrid forms.

Works like those discussed in this essay could not have been imagined using other media. All explore characteristics unique to computing. The tools used in these works are still evolving, and new applications for these tools are being developed in other fields and disciplines.[5] Works like these are imagined by adapting digital tools to advance goals that might not have been anticipated by the hardware and software developers, and this in turn frequently, although often indirectly, impacts how the tools are further developed or how new tools come to be invented.

The emerging rhetoric and poetics of digital media are a result of this kind

of adoption (across fields), adaptation, and reinvention, which cycles between independent innovators, information technology professionals, researchers, scholars, artists, and almost all other users as well. This level of exchange was less common or even nonexistent in the growth of most nondigital media tools, from the printing press to the film camera; and when it did occur, it was mostly between specialists.

In computing, all works are multimedia and we are all multimodal; makers and users move fluidly among concepts, cultures, and forms of expression. Once positioned by media as relatively passive readers and viewers, the individuals who now navigate digital works are computer users. While few might watch a movie in the cinema and immediately find themselves loading a film camera, most who view digital works like those in this essay will soon—or even simultaneously—do other things on a computer as well. The flow between engaging works like these and doing other personal work is seamless, as is the cycle by which the poetics and rhetoric of works are interpreted, adopted, and adapted. In this sense, there is a new kind of contiguity defined by our networks and exchanges, by the extensions of ourselves in the digital environment. And this contiguity is also a montage.

Notes

1. There is a corollary in gaming: it is often the case that the more figures resemble humans the more they evoke a sense of the uncanny border between the living and the mechanically reproduced, what animation and gaming designer Glenn Entis (2007) describes as the "the zombie effect."

2. For further discussion on the relation between the long take and montage see Coover (2001, 2003).

3. "What we will have of what we are: something past . . ." (2003), http://www.z360.com/what.

4. My multimedia installation *Something That Happened Only Once* had its premiere at the Esther Klein Gallery, Philadelphia, January 2007. *Unknown Territories* (2008) can be accessed at http://www.unknownterritories.org.

5. For example, social scientists like Eric Margolis, president of the International Society of Visual Sociology, are adapting digital techniques like these to help students develop interpretative historical and ethnographic models.

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