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A Companion to Digital Art

Edited by Christiane Paul



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Interactive Art

Interventions in/to Process

Nathaniel Stern

Introduction: Bodies in Process

When we move and think and feel, we are, of course, a body. This body is constantly changing, in and through its ongoing relationships. This body is a dynamic form, full of potential. It is not “a body,” as thing, but *embodiment* as incipient activity. Embodiment is a continuously emergent and active relation. It is our materialization and articulation, both *actual* and *virtual: as* they occur, and *about* to occur. Embodiment is *moving-thinking-feeling*; it is the body’s potential to vary; it is the body’s relations to the outside. It is *per-formed*, rather than *pre-formed*. And embodiment is what is staged in the best interactive art.

This chapter looks closely at works by contemporary artists Rafael Lozano-Hemmer, Camille Utterback, and Scott Snibbe, who each have us encounter the body and its ongoing emergence *with* other matter and materials. While Lozano-Hemmer frames the mutual emergence of bodies and space, Utterback highlights how signs and bodies require one another to materialize, and Snibbe accents bodies (plural) as they manifest along with the communities they inhabit. I use these and other artists’ works to intermittently differentiate between the interactivity of digital systems and relational emergence; to clarify the different levels and strategies of interaction or engagement with digital technologies; and to look toward the future of what the category “interactive art” may become. Ultimately, I argue that interactive artworks and installations are interventions in/to process: they create situations that enhance, disrupt, and alter experience and action in ways that call attention to our varied relationships *with* and *as* both structure and matter. At stake are the ways we perform our bodies, media, concepts, and materials.¹

Bodies and Spaces

Rafael Lozano-Hemmer's *Body Movies* (2001) projects thousands of photographs, several at a time, onto large buildings around a square. The piece has been shown in cities such as Rotterdam, Linz, Lisbon, Liverpool, Duisberg, Hong Kong, and Wellington, among others. The photographs were themselves taken on the streets in the host cities, and are shown using powerful, robotically controlled data projectors from above. From the center of the square below, huge floodlights wash out these projections, making them appear close to white. The images are revealed only when passersby on the square block out these lights with their shadows, so that the photographs underneath them can be revealed. These shadows range in size from 2 to 25 meters, depending on a visitor's distance from the light or building, and are tracked in real time with Lozano-Hemmer's custom computer vision software. Computer vision, more commonly known as interactive video, combines the use of digital video cameras and/or infrared or other sensing hardware (such as the Microsoft Kinect), and custom computer software, so that artworks can "see" and respond to bodies, colors, and/or motion in space. If the participants in *Body Movies* on the "live" square align their shadows in such a way that all the human bodies in the image beneath are revealed, Lozano-Hemmer's program triggers the next of the photographs in his sequence.

All of us have played with shadows—particularly our own—and *Body Movies* relies on the sophisticated vocabularies we have developed with them since childhood. But while interactors immediately understand this interface, the experience and practice of performing their bodies and shadows is framed and amplified: both literally, because *Body Movies* is a work of art, and also due to the sheer size of their shadows and the photographs beneath, which change the architecture, the images, and the atmosphere around them. The revelation of other bodies and spaces in the images that are actively unveiled from beneath these shadows—a play on presence that Lozano-Hemmer ironically calls "tele-absence"—and all the other bodies working together on the square add layers of complexity to the interaction. Viewers interact with all, part, and parts of the artist's photographs of people and places, bodies and spaces, from around the world. They often try to tell a physical story by playing around the images' contents, interweaving their real-time shadows across each other and with the bodies and spaces in the images, sometimes triggering new photos from Lozano-Hemmer's database.

The artist's collaborating and often dancing participants become active agents in an unfolding and enfolding narrative of bodies and space, agents whose flesh—depending on where they individually move—might collectively span several stories high, or remain close to their actual size, and everything in between. Together, they create complex shapes, animations, and architectures through investigative movements. Viewers run back and forth between the buildings and lights, shifting their individual sizes relative to other bodies, the architecture, and the photographs of the other architectures and bodies they are revealing. They use these tele-absent and projected forms in relation to each other, to the constructions around the square, and to the partially broadcast images in order to perform. I have watched participants in this project use shadows and images to shadowbox a giant, swallow a dwarf, smash a building, or carry a friend or foe to safety. People move between intimate and exaggerated flows, hand shadow-puppets, and sweeping and running formations. They produce animated rabbits and dogs, pour drinks from on high or eat arms of

others down low, ride bicycles, and run or skateboard. They pull and push each other, and across each other, and across times and spaces—and all across the surface of a large building, rallying back and forth in size as they move toward or away from the light. The more creative performers play out complex scenes in the previously photographed international cities, their shadows enabling them to bicycle through Madrid, use real-world umbrellas to protect virtual Italians from the rain, or create multi-armed beasts that grow and shrink as they scale building walls or invade foreign lands. They align themselves with strangers and friends alike, with others both present and absent, in a communally shared and created space.

There are at least two techniques of “performance”—which I define as “the process of formation”—at play in Lozano-Hemmer’s work. First, there are the ways in which technology makes space (and bodies): the carving out of the actual buildings and square through extant architectures; the virtual shaping of our movements through light and shadow; or the anticipated triggers that ask us to align our bodies with those in the artist’s images. And second, there are the ways in which our bodies produce space (as well as themselves and each other): our movements and static moments in the large interactive area; our shadows on the buildings; our narratives between both; and the images beneath them. Here we move-think-feel spaces and bodies as they come to be; they are *always* transforming what and how they *are*, together: both as conceptual constructs, and as material “things.”

In other words, Lozano-Hemmer’s piece is an exemplary interactive artwork not only because of the technology it uses, but also because of the *situation* it stages and in which it intervenes. For the purposes of clarity interactive art (and interactive installations) can be defined as works of electronic and digital art that feature various forms of sensors or cameras for input; computers, micro-controllers, simple electronic circuits, or other digital or analogical terminals for processing; and any form of sensory output—audiovisual, tactile, olfactory, mechanical, or otherwise; and where all these are placed together in a system that responds to the embodied participation of its viewers. In these circumstances interactivity is understood as the required physical activity of a viewer-participant in order to fully realize a technology-generated and process-based work.

Although this way of understanding interactive art may be necessary for the sake of differentiation and analysis, it establishes a flawed priority: an emphasis on the computer, sensor, or projection, on the tools we use rather than the situations they create. We focus not “on the dynamic form of experience [...] It is the form of the technical object that is emphasized, for what it affords” (Massumi 2011, 45–46). If we explain what interactive art *is* primarily through technology, then we will comprehend it as merely a technological object. We should, rather, approach what interactive art *does*—and what *we* do—when it frames our moving-thinking-feeling (or *affect*). Moving and thinking and feeling are all a part of the same embodied and embodying processes, and interactive artworks such as *Body Movies* stage a rehearsal of some of their possibilities.

Posthumanities scholar N. Katherine Hayles makes a distinction between the “culturally constructed” body that is “naturalized within culture,” and our experiences of embodiment, which are “contextual, enmeshed within the specifics of place, time, physiology, and culture” (Hayles 1999, 196, 297). Her distinction is somewhat parallel to Mark B.N. Hansen’s, who, following the early phenomenology of Maurice Merleau-Ponty, distinguishes between the “body-image” and the “body- schema.”

The body-image is an understanding of the body and identity. It is a “predominantly visual” or semiotic “representation of the body, a primary resemblance” (Hansen 2006, 37). The body-schema, on the other hand, is a “preobjective process of constitution” (Hansen 2006, 39); it is enactive, it is *becoming* a body. While extremely useful in thinking-with the importance of interaction, many theorists discussing embodiment have criticized phenomenological approaches such as Hansen’s and Hayles’s, because, with such philosophies, every experience centers on *human* perception. Artist and philosopher Erin Manning asserts that we must recognize the potential of virtual effects and bare activities—where being and becoming exceed the human, in what she calls the “more than human” (Manning 2009). Embodiment is always more than what we know, more than what we experience or are; its potential must always include emergent experiences and practices outside of human perception.

With interactive art, “the body” is addressed not only as a cultural construction or contextual experience, but as a relational process. Interactive installations amplify how the body’s inscriptions, meanings, and matters *unfold out*, while the world’s sensations, concepts, and matters *enfold in*. New media has the ability to intervene in, and challenge, not only the construction of bodies and identities, but also the ongoing and emergent processes of embodying relations, as they occur. Interactive art intervenes into process, that is, it breaks down and calls attention to what is *becoming-with* bodies.

Body Movies, for example, invites us to rehearse modes of making public, embodied, and communal space. The people on the square, writes Lozano-Hemmer, “embody different representational narratives,” creating “a collective experience that nonetheless allows discrete individual participation” (Lozano-Hemmer 2001). While each active participant encounters their own performed body through shadow play, they also encounter performing the square and buildings and people around them, the shaping of this space and its continuous relationship to their own flesh, as well as to other spaces and bodies and matter—in their immediate environment and (in images) around the world. In *Body Movies*, participants’ (and space’s) movements—all of which they may or may not be consciously aware of—intervene in the mutual emergence of a broadly defined and engaged embodiment, and a broadly defined and engaged space. The piece literally stages drawn-out and processual bodies and spaces that we simultaneously activate and experience, through movement. *Body Movies* productively confuses an ongoing embodiment and an architectural/public space-making, asking us to practice the relation of inside and outside, personal and public, actual and virtual. It inaugurates a complex and creative dance, where our inter-activities frame how bodies and spaces move and think and feel and become, *together*. Here moving-thinking-feelings should not be understood as exclusively human endeavors. They are the forces of all things-in-process, always shifting each other’s trajectories of becoming. And interactive artworks such as *Body Movies* are not just encounters with what *is*, but rehearsals for what *could be*.

Lozano-Hemmer’s work attunes us to our body’s making of space, and space’s making of bodies. *Body Movies* emphasizes a body-space that cannot be reduced to the boundaries of our skin, the limited image we see on screen, or even our present movements around the square. Here our moving, affected, and affective bodies evince stories and histories that are made sensible in and as space; they are incarnated, together. Both space and bodiliness are potentialized, are accented as susceptible to folding, division, and reshaping, open to continual negotiation. Participants shrink

and grow, live and transform, and shift with the spaces and stories they move with and in and *as* their environment. Body and space, here and elsewhere, are implicated in one another, and each presence (or absence) is an incipient action that we *feel* as instantiated through movement and relation. *Body Movies* effectively and affectively intensifies our practices of process, our moving, interrelating bodies and spaces as they come to matter. *Body Movies* has us encounter a complex layering of bodies and space; it frames the performances of embodiment and /with spatialization.

Interaction and Relation

This is not to say that *Body Movies*, or any interactive artworks for that matter, *produce* relational processes, or frame *all* that is our relational becoming-with. Interaction and relation are not the same thing; but they are related.

The recent academic turns to embodiment and affect, process ontology, and the new materialisms note that all of matter and bodies are active, continuously variable, and relational. Activist philosopher Brian Massumi (2011, 2) reminds us that matter goes from “something doing to the bare fact of activity; from there to event and change; then on to potential and the production of the new; coming to process as becoming.” Subjects and objects are inter-given; they only exist as in-process relations to other in-process subjects and objects, relaying nested movements and potentials across themselves and each other, as they continuously form. All is always emergent, and of the relation. Relationality is continuous; it is embodiment’s (or materiality’s) always-on-going formation.

The interactivity of software-based digital systems, on the other hand, is pre-programmed. With few exceptions, it is a back and forth: “I do *this* and *that* happens.” There is a danger that we, as participants, are instrumentalized as interactors, and thus become *less* dynamic, rather than more so. Interaction becomes a game with a goal, and we must behave in a specific way to win it. Poorly conceived interactive art can force particular and thus predictive movements, which then may as well be static because our moving-thinking-feelings are pre-formed.

Interaction, as it is understood in the context of digital technologies, is much more finite than relationality. While it is responsive, the possible outcomes from our performances are restricted. Interaction, in other words, is a limitation. But it can also act as an amplification. Here is an apt analogy: a directional microphone can only pick up sounds directly in front of it, and within a small area; it amplifies what it hears, for example birds chirping and the sound of soft wind blowing. We, as listeners, do not merely “hear” those sounds, however. We perceive more birds than we hear, we *feel* the wind blowing, we imagine nature and the morning, the smell of grass. Like this directional microphone, or the frame of a canvas, or any work of art for that matter, interactive art can highlight and magnify particular aspects of being, so that we experience much more than sits in its frame. At its limits, interactive art *disrupts* our relational embodiment, and thus attunes us to its potentials. Embodiment is per-formed in relation, and interactive art stages us, and our surroundings, so as to suspend, amplify, and intervene in that very performance. It is a space to experience being and becoming, and to practice potential new modes of their relational emergence.

Bodies and Signs

In her *External Measures* series, Camille Utterback uses an overhead computer vision system to track bodies and trigger painterly and animated marks on screen, which collectively create an ongoing image. The marks look and move like actively reconfiguring geometric patterns, smudging pencil sketches, dripping paint, or seeping molding clay, depending on the piece in the series. Their position and velocity within the projected image are initiated and continuously performed by both the location and movements of the participants in space, as well as the marks' own internal logic. Utterback's dynamic paintings are generated as they move, affect, and are affected by participants' gestures and stasis, or presence and absence, in barely predictable and organic ways. And each installation invites a very different style of interaction.

Utterback's marks immediately appear in response to participants' attendance and movement, and they are animated—leaving trails of what looks like graphite or acrylic or earth—based on the flow, stillness, and the number or lack of people in the installation area. An overall composition emerges and continues to transform over time, as layers of persistent marks and bodies feed back between interaction, performance, and image. Each piece “measures” how we move or stand still, and creates an “external” visualization of that movement and stasis. Participants in turn “monitor this external data and measure out their actions in response,” creating an “intricate dance between computer algorithm” and affective involvement (Utterback 2002). “Measure,” in Utterback's sense of the word, does not refer to measurement but rather to an active “measuring up,” a diagram of bodies and images, being made. It is a play on the moving-thinking-feeling and making of the screen image—and its ongoing signification—with our interacting and always relational bodies. Her use of the word “external” is also an ironic pun on interior/exterior between each and the other. Neither body nor matter nor sign are a declared subject (or object). Utterback rather highlights bodies and images as a mapping across each other, an experienced and practiced formation.

The first piece in Utterback's series, *External Measures (Rectangle)* (2001), follows our movements, and our relation to each other, to create a collection of angular shapes that fold in on themselves. It was produced, released, and exhibited along with her second work, *External Measures (Round)* (2001), a circular projection where “lines curve and snap between people like crazy elastic bands, creating a dynamic tension” in the image and space (Utterback 2002). Utterback's third *External Measures* (2003), saw a slightly more organic relationship, where constant procedural animations of slowly moving gray lines are pushed aside by viewers' movements, making way for more sparse but saturated color lines left in their wake. “Subtle brown and black swaths are etched between any people in the space” and “scratchy white lines connect” each of us to our point of entry into the interactive area (Utterback 2004). A given participant's appearance alters the traces on the screen by erasing marks in the projection—ones automatically drawn, as well as those left behind by others—and as time goes on and the software continues to draw over the composition, eventually overwrites all traces left behind. *External Measures, 2003* thus creates a “hypnotic tension between presence and absence, mark-making and erasing, human gesture and algorithmic drawing” (Utterback 2004). Here, we literally write with our bodies, an at-once drawing and meaning-making that is staged as the *work* of the art.

In Utterback's *Untitled 5* (2004), visual feedback between multiple bodies and the projection influence one another immediately and over long stretches of time. The artist's goal was to "create an aesthetic system which responds fluidly and intriguingly to physical movement in the exhibit space" (Utterback 2005). Utterback uses the same computer vision system from her other works, but introduces more generative complexities in her pixel painting that are not only affected by moving bodies, but still bodies, multiple bodies, and absent bodies. The marks that we trigger and that have been cumulatively collected continue to interact with each other even after we have left the installation area. The result is a continuous, hauntingly and haltingly poetic moving image, which invites participants to make and find meaning in, with, and as embodied relation.

What we see first when entering the interaction area of *Untitled 5* is a real-time, bird's-eye view silhouette of our bodies, on an eggshell background, and filled with sketchy, graphite-like, criss-crossing lines. As we move across the space, these sketched patterns move along with us, while a red colored line, drawn out from our center, maps our trajectories. When we leave the installation, this trajectory line is overlaid with tiny organic spots. The longer we are still and in the space, the larger these marks are. The tiny points can be pushed from their location by other people's movement in the space. As they are pushed, they act like sponges of ink or paint being dragged across Utterback's canvas, leaving streaks and smears of color in their wake. Displaced marks also slowly return to their original location, making yet more swaths of color. The junctions between past and present movement and stillness, between motion paths and who does or does not follow them, connect different moments of time, different bodies in space, the continuous compositions and how we might read them, as well as the relation between these three.

The behaviors behind *Untitled 5* are never explicitly revealed to its participants; the work instead invites us to practice *styles* of "kinesthetic exploration" (Utterback 2005). The embodied sense of "more," of a relation to the world's larger goings-on, is always prevalent. For Utterback, a "visceral sense of unfolding or revelation," of both "immediacy and loss" is integral to the work itself. Like the "experience of embodied existence itself—a continual flow of unique and fleeting moments," *Untitled 5* is both sensual and contemplative in its interactivity (Utterback 2005). The tensions she discusses result from the suspension and thus intensity of our relations, a kind of attunement to how we interact, sense, and make sense. She does not elicit specific gestures or behaviors, but rather has us encounter what movement does, what it makes, and what it changes. This is to say that—while the interaction is limited by the technologies the artist uses—neither our specific interactive movements, nor the technology, are where our attention is "drawn." Rather, we attune ourselves to the *quality* of our and the environment's moving-thinking-feelings, to the larger *processes* of embodiment and sense-making.

With *Untitled 6* (2005) (Figure 13.1), a work very similar to its predecessor, Utterback carries on with this interactive methodology, but aesthetically shifts to bold graphics that are less like abstract painting and much closer to minimalist, sculptural forms—like clay mush dropped from above. And with *Abundance* (2007), she highlights public space and social relationships—topics often explored in installation art from the 1960s until today—by moving her visuals onto the facade of a three-story building in San Jose, and viewer interactions onto the adjacent public square.

Each *External Measures* work—indeed, every moment in which any individual interacts with the variable traces of other/past participants on screen, in any given

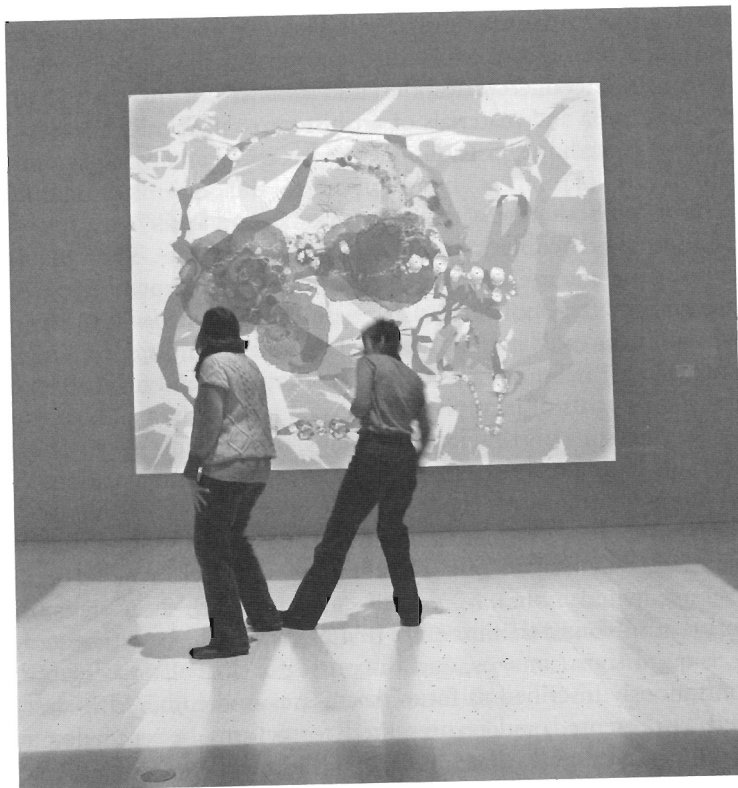


FIGURE 13.1 Camille Utterback, *Untitled 6*. Installation view. Milwaukee Art Museum, 2008. Photo: Tom Bamberger.

piece in the series—creates slightly different encounters between concepts and matter/bodies. These encounters accent multiple relationships with her artwork, and with art- and mark-making more generally. Where one *Untitled 5* viewer, for example, may utilize stillness in order to leave large splotches that later participants may or may not draw out over time, other ones can run and drag illustrative trajectories across an empty field or slowly concentrate their gestures, treading lightly across the stage, so as to smudge a crowded canvas. The interactive experience can be care-ful or care-free, and any performance might produce subjectively stunning images or visual garbage—similar to a professional artist's practice in the studio.

The live relationships and generative algorithms in Utterback's *External Measures* series become more and more complex as she works with her media over time. They also begin to collectively en- and unfold our relationships to art history and practice and, more generally, the signs and symbols or concepts and gestures therein. Utterback began the series with simple shapes and immediate on-screen responses that might allude to early cave paintings or mathematical drawings (*Rectangle* and *Round*); then moved on to the use of negative space and real-time animated images, reminiscent of both landscape painting and early motion graphics (2003); again pushes forward on this historical arts trajectory in *Untitled 5*, referencing the affective and performative—and in this case, collaborative—possibilities of abstract expressionism à la Jackson Pollock; turns to the embodied encounters of minimalism in *Untitled 6*; and

references happenings, the Situationists, and Fluxus games in *Abundance*. Viewers' movements in the *External Measures* series are a playful reminder of, allusion to, and interaction with, the literal, historical "art movements" of the past. Participants are invited to use the media and materials of art history to physically relate to the images and trajectories of preceding artists/interactors, creating a living collage of transversal expressions and explorations. They construct and assemble multidimensional representations of "embodiment with art" or "bodies and signs" on a two-dimensional plane, and continuously feed back into that image and process. The variable aesthetics and interactions that emerge conjure up memories and rememberings of not just abstract expressionism's embodied splashes of paint or, in *Untitled 6*, minimalism's solid forms; but also art nouveau's graphic arts; collage and assemblage's found objects and pasted fragments in formalist composition; constructivists' and futurists' technological inspiration; cubism's goals of incorporating several perspectives and/or times; Dada's absurdities; or surrealism's unconscious revealings, to name just a few. These aesthetics and rememberings stage and intervene in the movement styles of creation, the non-representational representations they create, and the relation between the two.

External Measures has us move-think-feel the signifying practices of writing, drawing, painting, and making art as simultaneously performed and embodying practices. We are invited to *re-member*—to embody again—how signs, images, and the discourses that surround them require bodies in order to be articulated. And bodies, in turn, require signs, images, and discourse for articulation. Here bodies and signs are continuously inscribed as future memories; remembered as past meanings; and practiced as presented and re-presented formations between past and future. Utterback's work highlights that making meaning always requires bodies, and embodiment always requires that meaning be made. This is art about art and artists, images and image production, signs and bodies; it invites us to feel and rehearse how we express, how we are expressed, and how we relate to each of these embodied processes, both historically, and in the moment. We perform new-but-not-new images into existence, and these (now preformed) images feed back into how we perform, again. Utterback invokes our relationship with her individual artworks in order to evoke our affective encounters with the work of art more generally. At stake is how meaning and bodies and matter are articulated and presented through always interacting and relating agencies—conscious and unconscious, human and non-human, present and non-present, living and otherwise. Here we encounter the relational sense, the emergent language, the preformed and performed continuity, of art.

Such are not the only encounters that interactors may have with/in the works discussed by Lozano-Hemmer and Utterback. As situations, they enable an investigation of implication and impact, of what and how we experience and practice, and of the relations between meaning- or space-making and materiality in process.

Processing Interventions

Artists such as the ones discussed in this chapter recognize the processual and relational formation of bodies and spaces, of concepts and images, of communities and their histories. They use their work to interrupt and amplify the potential in these processes. But what they stage are not only interventions into process; they are also interventions *in* process, always interrupting and interrupted themselves, as they occur; and they are

also interventions for us *to* process, where affection and reflection interplay. Here *affection* is that which is felt (and thought) in our moving, and *reflection* is thought (and felt) in our making of meaning. Art and (its) philosophy have the ability to create, transform, and mobilize one another.

In encountering and rehearsing affection and reflection *with* interactive art there is potential for different ways of relating. How might we find alternative thoughts and feelings through and with our movements? Can we be more careful in how we become bodies, become spaces, become (a) people? How should we better make ourselves in and with and for the world, and others around us, through our activities? Can we take account of and change how we move and think and feel in the everyday? And what are the implications and impacts of that change? Interactive art has the potential to accent our potential: to show us how to move and become differently.

Bodies and Communities

Scott Snibbe's *Screen series* (2002–2003) consists of cinematically inspired interactive installations, in which our embodied performances contribute to the works' content, over time. It plays with the languages of film, animation, and shadows to create a frame for potential narratives where social rules and bodies in motion interact with and influence one another. We are staged as *bodies* (plural) and together substantiate communal rules that suggest societal structures.

Snibbe's *Screen series* encourages viewer-participants to use their shadows as animated, iconic re-presentations of the body. Each work begins with the same premise: an empty, white projection on a clear, white screen or wall. Here the rectangular projection already has social implications: it references the filmic or computer screen and what each of them means to us culturally and historically. When viewers move between the projector and the image they cast shadows which Snibbe captures and reuses in animated form, so that we may interact with screen and with cinema, with the underlying narratives, meanings, and histories that screen and cinema bring to bear.

In *Shadow* (2002), for example, the projector acts like a spotlight and casts the shadows of any given viewer or viewers beyond it. What each performer may be unaware of is that Snibbe's software begins recording as soon as she or he has entered its domain. When the viewer steps away, "the screen replays the movements of their shadows over and over, so that their shadows are detached from their bodies." These videos "become a recorded performance for a larger audience, and the work is revealed as an instrument for composing cinema with one's own body" (Snibbe 2003). Here the screen becomes a material memory and living record of what bodies do, are, and could be. In *Shadow*, our embodied performance in front of the screen is archived as a kind of miniature narrative, an ongoing artifact: performed, then actively responded to by others, and thus performed again.

Snibbe's *Screen series* continues, from here, to build on this basic premise of coupling body-as-performed with a public, and constantly transforming, community. In *Compliant* (2002), our shadows cause a small projected rectangle/screen "to be distorted and pushed away, as if the screen were a rubber sheet" (Snibbe 2005). Although inspired by the hat Charlie Chaplin wore as his famous Tramp character (who appeared in several films between 1914 and 1936), Snibbe gives his screen-within-a-screen a sentience that more closely resembles that of Peter Pan's shadow running away from him.

The rectangle's edges bend and ripple and slip away when our shadow-fingers push or grab its form. Snibbe sets up a quirky interplay that gestures—and asks us to gesture—toward the structures, forms, and games that bodies make, and, in turn, the bodies that structures, forms, and games make. We and the social space of his screen are staged as entwined game players and rule makers, involved in a kind of narrative-driven society, which is performed by multiple bodies over time and space.

Snibbe's *Screen series* comprises six pieces altogether, and the interactions range from leaving behind animated silhouettes or distorting screens, as in *Shadow* and *Compliant*, to creating collaborative and moving shadow drawings amongst several participants (*Impression* and *Depletion*, both in 2003), and playing interactive games of tag, where projected light illuminates the shadows of the it-person, and is transferred to the next one when their shadows touch (*Concentration*, 2003).

Some viewers did not even realize the work's interactive potential, merely standing to the side and admiring the quality of light. Snibbe recounts that one woman “reflexively stepped back” when “the screen pulled away from her body” at first encounter with *Compliant* (Simanowski and Snibbe 2006). After understanding and acclimating to the rules of the experience, she engaged with it intimately, waving her fingers and tickling the frame, or using her tongue to make small impressions on the square's edge. Another viewer stared at the mere qualities of the square without ever interacting, while still a third “strode purposefully through the projection without looking back. Behind him, the luminous rectangle shuddered and jerked away, distorted from a clean rectangle into the warped form of a fallen tissue” (Simanowski and Snibbe 2006). Snibbe's work, says journalist Cate McQuaid (2005), “invites drama: one person might make wild gestures; two people could act out a pantomime.” Playful interactions by and between each individual in the space feed into how current and future interactors decidedly engage. Here bodies encounter and rehearse both non-representational *and* signifying movements both with other bodies and Snibbe's body of work—which did, does, and will help to continuously perform potential narratives and mini communities over the course of an exhibition.

Snibbe's *Deep Walls* (2003), the height of the series, invites viewers to interact directly with many bodies at once, and over time. This piece basically multiplies the interaction of *Shadow* into a grid of sixteen individual boxes (Figure 13.2). When stepping in between the installation's projector and its projection, viewer-participants cast their shadows over the grid, obscuring bodies and parts of the whole, while a camera captures their silhouetted movements. Once they leave the frame of light and their shadows are no more, their recording is placed in one of the boxes, replacing an older film, looping indefinitely alongside other clips of body-outlined actions in adjacent boxes. Every active performance snippet in front of this cinematic narrative is thus suspended, stored, and re-involved in one of its comic book-like square frames. Each supplants an animation that was there before, and is put alongside fifteen others similar to but different from it.

In *Deep Walls*, each shadow-body has more than a dozen collaborators in its grid (which can include groups of people working together on one cinematic snippet). These performers often try to outdo each other, throwing their children in the air before catching them, kissing or dancing or interacting with one another or other boxes on screens, doing cartwheels or whipping their hair, or sometimes even playing out familiar scenes from classic movies (I saw attempts at *Indiana Jones* and *Casablanca* when it was on view at the Milwaukee Art Museum). The accompanying images



FIGURE 13.2 Scott Snibbe, *Deep Walls*. Interactive video installation. San Francisco Museum of Modern Art, 2002. Source: Scott Snibbe Studio.

might intimate iconic iPod advertisements with their stark silhouettes, or allude to graphic novels—but ones that can move through time and space. We see a complexity of narrative imagery that emerges in a mobile, physical, and non-linear fashion, as each individual interaction feeds into the whole, and into future performances. Some interactors glide past, others run or dance and shake their heads and tresses, still more try to work together within a frame and perform deeper meanings into the micro-narratives of a given square—which may or may not contribute to the whole in the ways they initially intended. Here the artifact of the screen is a small society made of embodied collaboration.

I am arguing that, given the open space of the gallery, the performances in Snibbe's work are always shared. Once the first audience member participates in *Shadow*, for example, we each watch the films by previous interactors before playing our own role, and then build on or respond to them; and we are fully aware that current and future gallery-goers will see and engage with the animations we ourselves leave behind. We interrupt an ongoing body film, and that interruption magnifies the productive transformation of both our bodies and the social structures (always) asking us to perform. The artifactual screen story is what we, as bodies, contribute to, relate with, and change, but it also informs what and how and why we contribute and interact. In our interaction, producing the work with our shadows, our body techniques are preconsciously aware of the cultural ways our shadow-movies might be read. We pass on traces of our bodies as part of an ongoing intercorporeal narrative.

This is most evident in *Deep Walls*. The grid of the screen encompasses many frames without itself having a frame (other than the live shadow body of the current player). As such, each frame extends into and is a part of the other, becomes an action and

reaction and interaction as “with.” The situation creates a partnering between body and screen (as a cultural artifact), body and bodies, body and society—all felt, in and with and as our bodies.

Deep Walls’ performers move and re-move, participate and re-member, their own bodies along with the organizing, re-moving and re-membling bodies on screen. In *Deep Walls*, and Snibbe’s work at large, we are creating an embodied and dynamic, relational community within our greater, collaborative community; we experience and practice the development of social reciprocity, with and through body and bodies. The artist asks us to encounter not only what a body is, but *how* it is, and how it is in relation to others, to society, to culture. And in this, he implicitly argues that we could—he in fact explicitly provides spaces where we can—rehearse different and perhaps better ways of performing our communities, together.

Strategies of Engagement

My accounts of Lozano-Hemmer’s, Utterback’s, and Snibbe’s works differ greatly from the promises of interactivity declared by many “digital” advocates. Advertisements for new gadgets commonly tell us, for instance, that new media’s individual activation, distinctive choice, unique preferences, and never-ending personalization are extremely desirable in our purchases. This language has dominated what digital and interactive products can and should provide, and what we as a consumer culture ostensibly want and even need. More specific to “interactivity,” the usually ill-defined term has become a “catch-all phrase that is used to sell many new media technologies as an added bonus, or special element” (Fuery 2009, 27). Simple button clicks on toys and finite menus in our audio and video players are sold as more choices and thus more democratic and thus freer and inherently better, when in reality what many techno-gadgets have to offer is often less than underwhelming, and tied to proprietary media formats or specific streaming services. The notion that “interactive” (art or otherwise) offers more choice and possibilities, is intrinsically democratic and thus superior, is both counterproductive and false. We almost never find a product that actually does all the things or plays and streams all the files and services we want it to, and the first investigation of any given digital artwork is usually to find out how it works technically (Where is the sensor? What does it do?) and how we can circumvent its inner workings. Furthermore, consumer-based interaction between ubiquitous technologies on social media platforms has been marketed as virtually compulsory in the most powerful markets of youth culture. Sites like Facebook or Instagram are all but required by peers of all ages, and are the perfect places to advertise the aforementioned techno-gadgets.

The use of technologies and strategies for art need not mimic, and can in fact work against, the same principles employed for capital gain. Massumi reminds us that the “regulatory principles of the technical process in the narrow sense are utility and salability, profit-generating ability.” Art, on the other hand, “claims the right to have no manifest utility, no use-value, and in many cases even no exchange-value. At its best, it has event-value” (Massumi 2011, 53). Art has a right to be “useless”: to have unknown outcomes, or *no* outcomes—at least in the traditional sense. Game art, as one example, can both utilize and speak back to the über-marketable gaming console, linear narrative trajectories, violence, and goal orientation. It provides a very specific

context for the interactor, and thus offers distinct possibilities for imaginative intervention into present-day capitalist regimes. Cory Arcangel's *Super Mario Clouds* (2002) is an exemplary work that challenges our understandings of games and their goals, Internet culture and what it tells and sells us, and our relationship to all of the aforementioned. A standard video game uses a joystick or other controller, the Kinect, or Wii to have us flail to compete—and focus is always on winning (and ending) the game itself. Arcangel takes the Nintendo Entertainment System's *Super Mario Brothers* (1985) and removes all of these elements. There are no protagonists or antagonists, no "good guys" or "bad guys." There is no controller. There are no rules or architectures. He modifies the original cartridge for the gaming system, so as to leave only slowly scrolling, pixilated clouds in a monochrome blue sky. And he shares his crack with fellow gamers, hackers, and artists online—just as gamers often share how to "beat" a game. *Super Mario Clouds* is less a game, however, and more a critical frame for encountering and challenging our relationships to game culture and industry.

Embodiment's relational emergence has also been co-opted as a point of valuable exploitation for profiteers. Many affect scholars, such as Nigel Thrift (2007), are arguing that the body's mutability has become a key resource for contemporary forms of capitalism, especially in the domains of the creative industry and digital culture. Contemporary discourses of creativity and innovation, particularly in the entertainment industry and its production of surplus value, rely on and hail a changing body that is capable of new contacts and sensations—and subsequently, experiences/ideas. Thus, a body's relation to dominant social forces is an ambivalent matter, one that must be approached by media artists with more care than that invested in the model used to sell mobile phones, tablets, and games. This has not always been and is still often not the case.

Contemporary curators Sarah Cook and Beryl Graham warn that many of their peers tend to use words that signal interactivity and connection "with the vague sense that they are 'good things,' but without any clear idea of the levels of engagement involved in each" (Cook and Graham 2010, 112). What are these levels of engagement, and what do we accomplish with them?

Activation. Pressing a button or a switch, or crossing a threshold, is a different (though not necessarily better) experience from looking, even given all that looking entails. Each is an act you can do, or not do, as a binary input that sets something in motion, for example, a video, a kinetic sculpture, or, in media theorist Kelli Fuery's example, a toy dog sold as "interactive!" that merely barks at you when turned on. The technical strategy of activation provides an easy way to conserve energy in a gallery space for the green-conscious, and in terms of viewer experience it is often deployed as a trigger that gives a minimal sense of authority and authorship—ironic or otherwise. *Navigation*, then, offers more engagement than activation. While still limited, there are a number of possible inputs and choices that can lead viewers in a multitude of predefined directions. A web site, DVD, or "Choose Your Own Adventure" book of interactive fiction are examples of navigable work. This strategy again is generally utilized to give an impression of command or choice, and sometimes a sense of exploration and possibility, while the artist or designer still maintains control of all possible outcomes. When combined with other artistic strategies, navigation can make for interesting sensory possibilities.

Pioneering artist David Rokeby's *Dark Matter* (2010) is an installation we navigate with our entire bodies, rather than using a simple mouse or remote control. He uses four

infrared cameras from different angles, and a custom computer vision system, to cut up a darkened room into thousands of three-dimensional zones. A small selection of these zones have sound files associated with them: breaking ice or glass, creaking metal, falling rocks, the bursting of flame. As participants navigate the space, Rokeby's software senses that movement, and those zones with the most physical activity will trigger the audio clips associated with them across an eight-channel speaker system surrounding the interaction area. We slowly creep around the edges, tip toe or drag our feet, jump and dive to trigger or respond to his complex space and sounds. It is like an audio sculpture we are connected to, a part of, in tune with. Rokeby is an expert at creating responsive sonic environments, and this piece builds on his previous work with movement, sensation, and cross-modal perception. He frames a complete and complex analogical exploration, within a limited, digital frame. Although both the inputs and outcomes are numbered, the use of sensors that read variation (how *much* motion?), and the layering of sounds, make *Dark Matter* border on, if not a part of, the next level of engagement above navigation—what Cook and Graham call *reactive* or *responsive* environments (2010, 114), and what I define as *interactive* art.

The works of Lozano-Hemmer, Utterback, and Snibbe are also solid examples in this category. Each piece is more than a series of choices between a small range of inputs matched to a small number of outputs (a navigable work). Electronic sensors such as cameras and microphones are complex enough to pick up a range of motion, and the software of interactive artworks responds with more than a mere trigger or singular path (creating ongoing photographic, or painterly, or complex narrative compositions). And this encourages *styles* of movement. While the computer is always limited in its responses, which are programmed, there are limitless possibilities for how we investigate and create the space of that program's situation. The real potential—indeed the real challenge, Manning points out—is to keep the participants' attention on the quality of their own movements, rather than the response of the machine. Manning implores us to add nuance by making technology's "failures felt" through techniques such as lagging, system collapses, and a loss of ground (Manning 2009, 72). Manning's point needs repeating time and again to this day, but was made as early as the 1970s, by interactive arts pioneer Myron Kruger: "The visual responses should not be judged as art nor the sounds as music. The only aesthetic concern is the quality of the interaction" (Krueger 1977, 423–424). The "degree of physical involvement" is far more important than "illusion" or "3D scenery" (Krueger 1991, 4). Feedback loops or generative coding, layering of time-based forms, or multiple and proportional sensors can create ever more affective digital spaces that might highlight the body, interaction, performance, and relation, rather than technology and its coded replies.

Analogical reactive art—electronic or physical work that does not use computer-based algorithms—is slightly different from its digital counterpart in that it allows for unlimited input and unlimited output possibilities in its variation. I put digital and analogical reactive art in the same category because our experiences of either, at their best, are entirely parallel. As Manning eloquently puts it, although in a different context, making "the digital analog need not be the goal"—media art becomes "evocative when its techniques make transduction felt, foregrounding the metastability of all moving systems" (Manning 2009, 72). In a successful project, we do not just move *in* relation, we move *the* relation (Manning 2009, 64).

Although Lozano-Hemmer's installation utilizes a predefined sequence of images we trigger, he also has us create complex shapes in real time. Utterback's generative

programming sees our movements initiate elaborate and layered, uncontrolled and collaborative paintings over time. And in Snibbe's work, we contribute a precise image of self, which then is only a small part of a continuous, communal engagement. Each is a suspended and amplified relation through interaction *with* a moving system that goes beyond the digital's preprogrammed responses.

Although it is not the colloquial definition of interactivity I follow for this chapter, what Cook and Graham call *interaction* means "acting upon each other"—where a computer or another person directly engages us, rather than merely responding to our movements. *Participation*, then, implies having a say; it requires viewers to contribute at least some of the content, and usually involves human-to-human relationships. In the digital art spectrum, this could easily include works that use social media platforms such as Facebook, Instagram, Vine or Twitter, networked games, or wikis. *Deep Walls* could be considered participatory in that we add our shadow-snippets to its database, as could Utterback's installations, where we leave traces of our interactions behind. Finally, *collaboration* means working directly with; the production of the piece sees a degree of equality between the participants, rather than small contributions of content. Collaboration generally takes place between artists, or artists and curators, since it is a reciprocal partnership (Cook and Graham 2010, 112–114). Interaction, participation, and collaboration have, of course, a longer history than electronic art.

Although the lines between many of the levels of engagement listed here can be blurred, they all—as critical tools, digital or otherwise—create situations in which our emergent relationships are highlighted. Their definitions, and what each achieves, are useful in thinking through the strategies for, and implications of, contemporary digital art. Here new media need not be singular in their position or oriented toward a goal, but have the potential to challenge and intervene in how we position, reposition, and proposition ourselves and our bodies in relation to other formations, both material and conceptual.

Interactive Futures

Interactive art is a frame for moving-thinking-feeling, an intensification of relations. With interactive art, an always-relational body is staged so as to suspend aspects of its own performance. Interactive art can concentrate and ask us to *feel* our existing practices as they are practiced, and provoke us to engage with what those practices imply. The goal is not to elicit specific behaviors or gestures, but to introduce us to techniques and approaches for encountering, understanding, and taking greater accountability with our continuous, relational performance.

The works discussed in this chapter focus mostly on the movement of the human body in an exhibition or public space. But the different forms of interactive art are vast. They make use of networked media and virtual worlds, social participation and generative coding, audiovisuals along with mechanical, tactile, or various multisensory outputs, analog or digital sensors, as well as many other new and old technologies and media in combination. In the gallery space, Danny Rozin's *Wooden Mirror* (1999), for example, creates real-time "video" of the people moving in front of it with motorized wood pixels that point toward or away from a light source. In a more private setting, Erwin Driessens and Maria Verstappen's *Tickle Salon* (2002) uses a combination of computer vision, tension sensors, motors, pulleys and rope to create

a miniature robot that tickles our skin, while we lie on a massage table. Between virtual and actual, Scott Kildall and Victoria Scott's *No Matter* (2008) asks international participants to model "imaginary objects" such as the Holy Grail or Trojan horse in online, 3D communities, then makes real-world models of their virtual creations. Mark Hansen and Ben Rubin's *Listening Post* (2010) culls large pools of live data from Internet sources such as chat rooms, bulletin boards, and other public forums, and translates them into a huge, and physical, structure, as dozens of screens with scrolling text in a corporeal space. Christa Sommerer and Laurent Mignonneau's *A-volve* (1993–1994) is a virtual environment inhabited by artificial living creatures that are created by visitors, mating and reproducing, and open to outside influences: the "touch" of human interactors influences them in various ways. Lynn Hershman Leeson's *Difference Engine #3* (1995–1998) assigns virtual, 3D avatars to real-world visitors, and invites us to engage with surveillance, voyeurism, digital absorption, and the spiritual transformation of the body in technical times. Random International's *Rain Room* (2012) is a full downpour in a large installation space, where the droplets part to let you walk through them, completely dry. And *Eyewriter* (2009), by Zach Lieberman, James Powderly, Evan Roth, Chris Sugrue, TEMPT1, and Theo Watson, uses custom eye-tracking hard- and software to write and project real-time, digital graffiti with the movements of the participant's pupils. Graffiti artist and activist TEMPT1 is paralyzed and has control only over his eyes, and his work was given new life as he collaborated on the project. The artworks mentioned here are part research, part philosophy or critical theory, part activism, and *all* put into practice with activity, both human and otherwise. They all use different models of interaction that require close investigation.

Recently, the turn to what some call the "non-human," and what Erin Manning calls the "more than human," has led to a renewed interest in *indirect* interactive art, which does not rely solely on human interaction for its response. Interactive art, Manning reminds us, has a tendency to place humans "too quickly at the center of each experience" (Goodman and Manning 2012). Manning's *Weather Patterns* (2012; this iteration in collaboration with Bryan Cera, Andrew Goodman, and myself) uses electromagnetic sensors that pick up feedback from a large range of data in the environment, including radio signals, air currents, and all forms of movement—both living and otherwise. What the system senses is then transduced into both sounds and signals across more than fifty speakers in a large installation, and into variable movements of a hundred yards of hung fabric across the space—the latter swinging and swaying due to motors and fans that continuously turn on and off. In addition to the ongoing, shifting electromagnetism of the environment that all people (and art viewers) are a small part of, the sounds and movements of the installation itself also feed back into what it senses. This creates a complex system where relationality is amplified as always more than what we, as humans, do and perceive.

Interactive art's production, experience, practice, and analysis can also lead to new or different understandings of other forms of digital art. What I have called *potentialized art*, for example, is per-formed, or transformed, through some kind of technologically mediated process. In my own *Compressionism* series of prints (2005 and ongoing), for example, I strap a desktop scanner, laptop, and custom-made battery pack to my body, and "perform" images into existence. I might scan in straight, long lines across tables, tie the scanner around my neck and swing over flowers, do pogo-like gestures over bricks, or just follow the wind over water lilies in a pond. The dynamism between my

body, technology, and the landscape is transformed into quirky renderings, which are then produced as archival digital prints. While not interactive by my own definition, such work invests in affect, relationality, and materialization in the process of its making and viewing. Here detail and abstraction exist as successive moments across the surface of the image—a result of my and the scanner beam’s continuous movements in relation to their surroundings. These prints wrap the potentials of time and performance into their production, and we see and feel aspects of that potential in the final print—even if only on a two-dimensional and static plane. Like the frame of interactive art, here is a limitation that is also an amplification. Potentialized art promises more than can be delivered, and we move-think-feel with and in its “more than.”

Although interactive installations follow and interweave several long, historical trajectories of art, performance, and electronic media, they are only now beginning to be understood within their category. Performance studies scholar Chris Salter’s *Entangled: Technology and the Transformation of Performance* (2010), for example, looks at technology’s ongoing influence on performance practices—including interactive environments—and vice versa. Art historian and practitioner Katja Kwastek’s *Aesthetics of Interaction in Digital Art* (2013) defines and unpacks what new media accomplish surrounding real space and data space, temporal structures, instrumental and phenomenal perspectives, and the relationship between materiality and interpretability. And my own *Interactive Art and Embodiment: The Implicit Body as Performance* (2013) puts forward a discrete critical framework for encountering interactive art as a space for practicing philosophy, and proffers several in-depth case studies.

Taken together, contemporary arguments make clear that the stakes for digital and interactive art are paramount. Our bodies and media, our material and conceptual frames and selves, are always in process, and in relation. We are in a continuous flux of becoming, forever changing through what we do: how we move and are moved by and with the environment around us. The world and its forces of moving-thinking-feeling perpetually fold in on each other, simultaneously constituting and affecting various bodies of matter and concepts, humans and non-humans. Interactive art, at its very best, sets the stage for the experience and practice of that constitution. It teaches us to affect a doubled agency in how we take account of, engage with, and per-form our surroundings.

Note

- 1 This chapter both pulls from and builds on the author’s book *Interactive Art and Embodiment: The Implicit Body as Performance* (2013). The texts are complementary in their approach to encountering and understanding interactive and digital art—as process-based intervention and embodied performance, respectively.

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