

Of the Untouchability of Embodiment I: Rafael Lozano-Hemmer's Relational Architectures

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Perhaps you have encountered the intriguing work done in the field of contemporary performative and interactive media art by Rafael Lozano-Hemmer via one of his numerous significant single work presentations across the world, such as *Levels of Nothingness* at the Guggenheim museum in New York (2009). You might also have connected via one of the large and popular stagings of his *oeuvre* -- at the Venice Biennale (2007), in *Recorders* (2008-2012) in Oldenburg, Sydney, and Manchester, or at the *Trackers* (2011) exhibition in Paris. However, it is most likely that you have come across Lozano-Hemmer's projects via his series of 'relational architectures,' [1] which began to appear in tandem with other early projects, such as *Surface Tension* (1993), and gathered momentum after his breakthrough with *Vectorial Elevation* (2000). [2]

It remains an unresolved question as to how it is that Lozano-Hemmer's work has seen such a rise in popularity as well as a remarkable artistic intensification during the first two decades of the 2000s. Surely some of this is due to the considerable scope of his projects, from the smaller 'subsculptures' through 'shadow boxes' to the later and differentiated 'pulse works' that have appeared in small, medium, and large scale versions. But if it is correct that the relational architectures remain at the heart of this media artist's projects, the explanation must primarily be sought via an encounter with these. *Displaced Emperors* appeared in 1997, *Articulated Intersect* as late as 2011, and the series comprises no less than nineteen projects to date (2012). A consideration of just two significant projects from the middle of the series sheds light on the coupling of popularity and artistic ingenuity in the larger part of Lozano-Hemmer's *oeuvre*. Encountering and reflecting on *Body Movies* (2001) and *Under Scan* (2005) yields the insight that Lozano-Hemmer's success hinges on his current designs of 'anti-monuments' as inviting relatively hospitable disturbances to how we conceive of relations between bodies, identities and built spaces at a time of ubiquitous computing culture. [3]



Figure 1. Installation of *Body Movies* - Ars Electronica Festival at the OK Centrum (Linz, Austria) in 2002. Photo courtesy of Raphael Lozano-Hemmer.

Both installations mildly disturb our sense of the situation at stake: the architectural design of public squares. They disturb the event taking place: citizens in everyday passage, encounters, or meetings. In addition, they disturb our current individual and social modes of lived experience in this kind of context, not least of which is self-identification via confirmation of existing body images. Relational architectures such as *Body Movies* and *Under Scan* are especially adept at presenting bundles of alien relationships: they present disturbances by the otherness immanent to our notions of spatial and architectural context, our event-specific temporalization, and our sensate lived experience of interacting and moving in an everyday life world. However, they manage to do this in the middle register. They operate in a midway fashion so as to move towards alteration -- but without necessarily introducing an altogether overt threat of disorientation, break, or radical existential change. Such relational architectures propose and afford relatively low-key modifications. They alter the environments and spaces in which we live, but primarily via modificatory overlays and mixes of existing architectures and new inventions. They afford none too dramatic happenings in the timing of our everyday culture. Not least, they permit unfolding interactional designs whose genetic and structural relational potentials lead to surprises as well as sensorial and perceptual enjoyment for individuals and groups alike.



Figure 2. Interactive exchange from the installation of *Under Scan* in Leicester (2006). Photo courtesy of Rafael Lozano-Hemmer.

Relational architectures such as *Body Movies* and *Under Scan* constitute temporary large-scale interventions in urban life whose numerous successful attempts to pave the way for relatively smooth engagements with otherness are in large part due to an inventive and custom-made deployment of contemporary media art and information technology. The key factor in Lozano-Hemmer's important projects resides in their unique capacity for actualizing relationalities of interactivity that harbor the potential for a marginally new technical and human existence. These actualizations take place on the level of fleeting and vague sensate expressions and lived experiences of what remains other. In short, these relational architectures are especially engaging in their shadow-plays drawing upon contemporary ubiquitous information technics. The shadow-plays created by the participant-spectators interacting with projected images of others, opens a dynamic of apparently hospitable and heterogeneity-oriented relations. [4]

As installation projects, *Body Movies* and *Under Scan* manage to draw upon, but also notably move on from our more well-known cultural concerns in network societies with rather abstractly virtual new media and the Internet -- in order to put the emphasis on unfolding 'embodied virtualities' and contextually situated interactions with computing. [5] Relational architectures such as these could be said to be inviting as well as softly hospitable to the other -- because they touch upon a pressing but still not quite recognizable problem concerning contemporary modes of human and technical existence. *Body Movies* as well as *Under Scan* present certain prototypical sandboxes for exploring the implications of living with current developments of ubiquitous computing. [6] These installation projects are certainly informed by contemporary technical tendencies. They are not altogether unlike ubicomp

developments for information-intensive mixed realities. [7] Like these, they draw experimentally upon mobile units, dynamic ad hoc networking, and a thoroughly decentralized distribution of multiple computational entities at various scales, often embedded more or less invisibly in the environment as meshes of sensors and actuators.

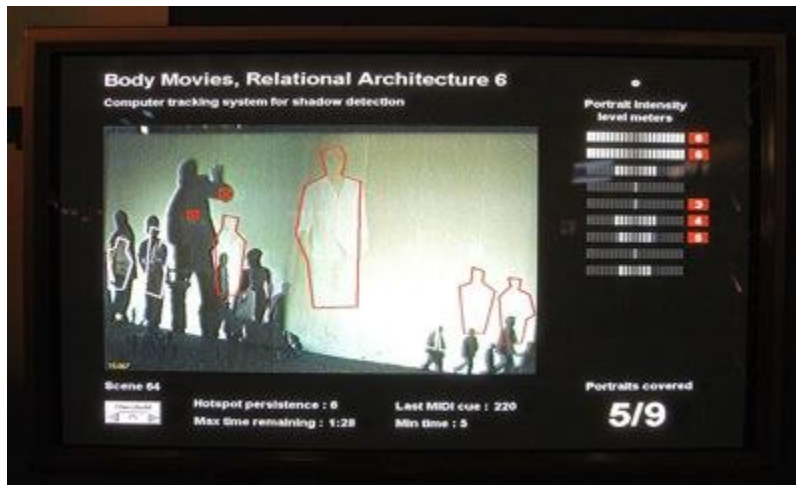


Figure 3. Screenshot from the monitor revealing the mode of operation for the tracking system behind the shadow-play. From the installation of *Body Movies* - Ars Electronica Festival at the OK Centrum (Linz, Austria) in 2002. Photo courtesy of Raphael Lozano-Hemmer.

Perhaps the major part of the popular success of these relational architectures derives from the ingenious introduction of shadow-play. This allows for an intuitively approachable interface between human and technical interactants. Moreover, it does this in a context and epoch characterized by new media and technical relations between shadows and light, the visible and the invisible. Shadow-plays permit intuitive approaches to mixed reality situations and events characterized by embodied multimodal interactivities that cross vision, haptics, proprioceptive and sensorimotor gestures, as well as affective movements. Lozano-Hemmer's installation projects include shadow-play as a remainder of other much older media art, including Indonesian puppetry, Chinese shadow theatre, Ottoman shadow-play, Greek Karaghiozis, and German silhouette animation. It is perhaps the invocation in *Body Movies* and *Under Scan* of such older traces and remainders that permits the arrival of experientially riveting and potentially thought-provoking situations and events. Via these undecidable oscillations self-reference and hetero-reference come to be at stake for the interactants.



Figure 4. Interlude every seventh minute -- laying bare the tracking grid. From the installation of *Under Scan* in Lincoln (2005). Photo courtesy of Rafael Lozano-Hemmer.

Considering the rather strictly limited existing critical sources, however, we are still missing an exploration and delineation of the ways in which Lozano-Hemmer's relational architectures engage with us in finely differentiated relational interplays among individual, social, and technical embodiments. These interplays obviously involve context-aware and event-oriented embodiments, whether these are considered human and/or technical individuations. [8] More specifically, though, one might well say that encounters with *Body Movies* and *Under Scan* are remarkable due to their affordances of interplays of a moving and tactile human sensation and the sensing proper to a dynamic, complex, and frequently quite embedded ubicomp information technology. Thus, the processual differentiations at stake in Lozano-Hemmer's relationally informative media art installations most often question current ubicomp developments. At the same time they affect and provoke us as human interactants and performers that have capabilities to exist otherwise with technics. [9]

Generally speaking, these relational architectures manage to intensify questions concerning our notion of existing with technical and human embodied virtualities. They do so not as a matter of pointing towards the kind of heavenly and strictly metaphysical transcendence that was all too often linked to the pursuit of VR and certain variants of posthumanism in the 1990s. [10] Rather, they question embodied virtualities as something that concerns moving towards actualizations transimmanently. This concerns the potentialities of embodiments and materialities that are transcendent *in* their ongoing immanent existence. [11] One might momentarily agree to put aside the currently unresolved question of the sensate context-awareness and event-orientation of ubicomp systems as such. [12] But then

one would very much like to follow a delineation of how *Body Movies* and *Under Scan* engage with human sensate experience in a finely graded movement towards embodied transimmanence. [13] For it is still a rather pressing concern to delineate the ways in which such installations contact and engage us - from vision through haptics and more or less coded sensorimotor gestures to affective movements involving the (technical) other.

Of the Luminous: Remains of Disembodied Transcendence

Human embodiment and the body [14] may at first seem almost completely untouchable and out of reach if one approaches *Body Movies* from the most obvious and overtly visualizing angle: via what presents itself as its most luminous and almost impossibly clear imaging. *Body Movies* is a large-scale installation for the public sphere, exhibited in numerous cities across the world from 2001 onward. Each time this project involved interactants with a special visual tracking system reminiscent of a context-aware and ubiquitous computing operating in mixed realities. Whether in Rotterdam, Hong Kong, or Québec this installation transformed a public square of the city. It did so by flooding 400-1800 square meters with interactive projections in the form of thousands of personal photo-portraits taken in the streets. However, one may well lock one's attention strictly on the *result* emanating from the embedded systems. They point very powerful and robotic searchlights to where they intercept pedestrian trajectories, and here one might well stay exclusively with the incredibly crisp *brightness* of the video projections.



Figure 5. Installation of *Body Movies* in Duisburg, Germany (2003). Photo courtesy of Raphael Lozano-Hemmer.

One's focus would thus tend to stay exclusively with the impact of deploying some of the brightest projectors in the world, generating up to 110,000 ANSI lumens of

intensity. One's focus would rather stay with the almost impossible clarity of the video-portraits revealed within the contours of one's shadow cast on a nearby building. Such a focus on the pure, luminous form of expression could very well lead one to note a return of a tendentially disembodied transcendence (ideal virtuality). You would, as in the 1990s VR projects, be witnessing a project that seeks to transcend the spatial situatedness and temporal finitude of human embodiment. Approached in this manner, *Body Movies* would concern an excessive departure favoring a disembodied transcendence. The impression would thus be one of leaving a trace as a processing of a pure light, teleological in character and presumably on the hither side of the physical, chemical, biological, as well as animally or humanly organized dimensions of your embodiment and its capacity for awareness.

The altogether pure light moving and penetrating *Body Movies* would be the untouchable idea of embodiment. Its omnipresence and power of penetration would remain beyond an all-too human embodiment and its psychic imaging. It would be pursuing a Platonic or teleological goal, drawing on its elevating and tendentially heavenly light in its purity and clarity. [15] This would carry certain reminiscences of William Gibson's cyberspatial "escape from the meat" and the later literary pursuit in the *Matrix* trilogy of various cybernetic spirits. [16] It would also reinvoke a kind of transcendence of human embodiment and its mortality which remains at play as some metaphysical ghost. One would, in effect, be identifying a move towards losing the body and human embodiment to pursue an abstract embodiment, if any, by way of looking directly at the light. If one is not looking at the purely blinding light of the sun, then suggestively, one is looking on a set of extremely powerful and invisibly controlled projectors in a floodlighting, searching movement.

Perhaps certain installation projects of Lozano-Hemmer's partly pursue precisely that ideal of immersion and visual simulation which generally characterized the production of virtual art in the 1990s. [17] There is, perhaps, in such projects a 'going beyond' favoring immersion in the simulative artifactuality of a transcendentially ideal virtual art -- so that the body and embodiment appear overridden with regard to their concrete and culturally constructed dimensions. Implicitly this includes a return of the philosophically well-known privileging of true insight as, in, and via pure light. Such as we have been following on the one hand, in retracing Jacques Derrida's deconstructive movements during a different rewriting of the metaphysical tradition and, on the other, in tentative reaffirmations in the modern episteme by Martin Jay. A certain emphasis on optical disembodiment necessarily accompanies any strict valorization of clarity, visuality, and light. [18] Hence I agree that parts of Lozano-Hemmer's work evoke a transcendental trace. This concerns, first, a trace of a pure, teleological light of omnipresence, pervasiveness, and ubiquity before and beyond man. Then, a trace of an optical disembodiment as it is met by looking directly at the

(sun)light. Finally, once embodiment as pure idea is left behind more concretely, it concerns a trace in the form of a noticeable difficulty with the decidability of human bodies, because such projects remain preoccupied with an elevation of virtuality rather than an embodied virtuality.

However, it would be rather misleading to ascribe to Lozano-Hemmer such metaphysical aspirations since here they hardly appear as more or other than remainders of a metaphysics of presence, a certain Western philosophical tradition which has today been deconstructed and put under erasure both generally speaking and in so many singular ways (as in Jacques Derrida's writings, amongst others). If one can still say that a project such as *Body Movies* is marked by a reference to the inhumanly pure and clear light, it seems predominantly to be a matter of a slightly more earthly angle of approach. To be sure, through this angle, Lozano-Hemmer raises a set of questions respecting the impact on a reality, and notably on a human *notion* of reality, proper to a relational architectural interplay between emergent cultural formations and ICT-developments of "omnipresence" (*ubiquitous* or *pervasive* computing). At the same time, however, this does not only, nor primarily, take place as an exploration of a more or less luminous, transcendent, and idealized virtual reality (VR) and its attempt to escape from the body and the finitude or mortality in human embodiment. [19] For the elevation, the light, and the enlightenment in Lozano-Hemmer's installations are, as a minimum, already incarnate on Earth.

One is thus not concerned with forms and figures strictly proper to a transcendental essence, as is the case with the son of God and (implicitly atheist or paradoxical) representations, in a textual or painterly sense for example. Rather, this light at stake touches upon more corporeal deformations, at the most of a quasi-transcendental character and in any case relating to the urban event, the changeable, or even the contingent occurrence. Thus, there is very little of a transcendental superstructure with Lozano-Hemmer. There is quite a bit more of an event-specific differentiation of representational planes. There is more of a rhythmic infill of space by initiating a public play of light and shadow. This is rather a dynamically scenic delineation of architectural foregrounds and backgrounds, an opening of perspectives which already appear distanced and traverse the installation in depth. In short, this concerns a capture of an optical space with a certain luminous embodiment at play. The dynamic self-delimitation of the installation form consists in the sketching of the contours of this optical space.

The optical space in *Body Movies* is perhaps partially organized with a view to, or background in, a phenomenology which expresses essence, but this space is decidedly not disembodied. For this one is much too aware of concrete public spaces, of too many squares, and of existing physical buildings. Likewise, one is much too aware of

the living humans in corporeally movable and moving relations to these -- individually, socio-culturally as well as communicatively and technically. Hence it is rather the case that *Body Movies* touches our notion of reality in psychologically and technically inventive ways. This takes place by reactualizing a physical reality, a certain embodiment, and cultural body formations. It also takes place by raising questions of possibly transcendental traits of "ubiquity" and "pervasiveness" (that is, questions respecting modes and degrees of information technological presence, pervasiveness, saturation, penetration, and ambience).

Generally speaking, *Body Movies* is thus of special interest for a contemporary corporeal media-aesthetics, not least because it responds to and further develops the intense engagement with virtuality throughout the 1990s. One recalls a set of broad cultural strokes within film production (such as the Wachowski brothers' *Matrix* trilogy or David Cronenberg's *eXistenZ*), or within architecture (as in digitally drawn or designed buildings in general, NOX and Oosterhuis' cyberbaroque *Freshwater Pavilion* or Greg Lynn's *blobs*). But one also remembers a great many academic efforts in research fields such as media studies, cultural studies, philosophy, interaction design, and computer science. Today, in the wake of these pursuits, it is not a matter of rejecting or altogether leaving behind virtuality. Rather, it is a question of the ways in which the further exploration and development of virtuality may take place. Notably, this is now a matter of developing virtuality in coexistence or relational interplay with an actual environment or world, in part through a certain 'immanentization' of the virtual.

As the sixth part of the series of relational architectures, *Body Movies* begins to question any strict privileging of a purely possible spatialization and embodiment and thereby seems to move along with a broader re-ontologization (or a supplementary 'physical turn') of the contemporary information culture. Here we witness a type of reinscription in virtuality of the body, actual embodiment, material texture, temperature, volume, and weight. This happens first and foremost via the developments of a telepresence with more immediate physical reach and effect in real time. In some cases this immediacy manifests through corporeal buildings of light, glass, stone, and metal. In other cases the effects obtain through various kinds of mixed, dynamic, and interactive remediation among inhabitants and architecture, or the presence of corporeal humans relating to different buildings. In this sense Lozano-Hemmer would probably agree with Lev Manovich that we, here and now in a millennium still young, are intensely preoccupied with a reality filled with electronic as well as visual, auditory, and tangible information. In other words, embodiment as touched upon in *Body Movies* partakes of an augmented and a mixed reality characterized, among other things, by spatial, temporal, and movement-specific overlays of information and technology, e-signals and the physical. [\[20\]](#)

Mixed Embodiment *in* Impersonal Images and Observations

Body Movies superimposes virtuality and actualized materialities in the real environment and in real time. It does so on a large scale (a public square and its buildings along with their computer layers) and on a small scale (the movements of personal and social bodies, their contours and shadows, along with their computer layers). It deploys ubiquitous computing elements to approximate a mixed reality of human and technical embodiments. Hence when interacting with its computational processes of tracking and image projection, one's attention should turn to the staging of what Mark Weiser called "embodied virtuality." This form of virtuality emphasizes the process of drawing computers *out* of the box so that the 'virtuality' of computer data is brought into the physical world, embedded and integrated more or less invisibly in the complex context of one's lived embodiment, perhaps even outside one's awareness. [21] From this perspective, it is but a delayed side-effect that *Body Movies* recalls a quasi-transcendental remainder of the pure light of virtuality as such. It is but a delayed and deferred effect that it also moves towards a mixed reality by recalling the privileging of a purely optical space and a disembodied observation of architecture as a pure and simulative image. [22]

Prior to this effect, *Body Movies* is already a mixed reality space where one's interaction, including all of one's body and embodiment, is at stake in remediating the symbolic and material status of a concrete public space (e.g., at OK Centrum in Linz, the Williamson Square in Liverpool, or the square in front of the Museum of Art in Hong Kong). It has already operationally introduced -- *in* the dazzling lighting and *in* the strikingly clear imagery -- traits of embodiment within its virtual architectural environment. Alternatively, one might say that it is already a project which introduces and makes felt in its imaging a set of recognizable traits of embodiment within the more virtual architectural dimension. Likewise, the space of screening and exhibition is already being abandoned along with possible reminiscences of the status of imagery in Plato's cave.



Figure 6. Installation of *Body Movies* at the Museum of Art in Hong Kong, China (2006). Photo courtesy of Raphael Lozano-Hemmer.

Interaction here does not so much revolve around a virtually imaged square. It rather concerns the mixing takeover of this square as a real environment or milieu. This mixing therefore does not simply *include* robotic lighting and clear image projections, but it already individuates these by bringing them close to interactants' embodied existence on the large square. Interactants animate one or more of a multitude of pre-recorded portraits of city people, by covering these portraits with their 'live' shadow. The interactivity is embodied even if key parts emerge from the virtual environment. The latter includes the sensor network embedded in the real environment and the complex video surveillance tracking system, which informs the server about the position and movement of interactants' shadow silhouette. The sensor network operates on embodied virtualities, e.g. by measuring the shadow (between two and twenty-five meters depending on interactants' distance from the light sources placed on the ground). This information retrieval of interactants' positions and bodily movements is what forms the dynamic background for calculating where to have a shadow intercepted by a projected portrait. It is the same tracking system that registers when all portraits have been revealed, then triggers the deployment of a new multitude of portraits so as to invite the public to occupy new interactive event-states and maybe generate performative narratives of re-presentation of self and other.

Traits of human embodiment are integrated *in* the remediation of the square by augmented virtuality, that is *within* the impersonal recording, analysis, and projection of the real world data of the portraits. Not entirely unlike a project such as *Displaced Emperors*, *Body Movies* puts in action a unique "architact" interface whose tactile pointer consists in a continuous animation of shadows along with humans. If one

would still wish to claim that a purely optical space is at stake, this would be due to Lozano-Hemmer according a high degree of activity to a visual background which remains vague and thus distant. As an interactant, one does not cease to look for a background, virtual or actual, which could perhaps be locatable in and as the milieu or environment in a broad sense (a square, a building, a facade, certain projected images) without allowing for a decision, however. Thus, participants do not immediately know where the background ceases and the forms of the installation take over. In its own manner, this distant background, an undecidable place between the coupling of video surveillance tracking to data spaces and the contact of projections with the facade of the castle, seems to support a visually vague sense of form. Here image formations may be most easily localized in the optical changes in the play of light and shadow. But this would be at the peril of losing all tactile referents and of having even contours cease as delimiters so as to become a pure effect of light and shadow.

However, I would consider it misleading to try to approach *Body Movies* only or primarily as such a return to a pure but vague optical space. Such an understanding would establish as a paradigm of aesthetics and sense a kind of direct remote vision. It would assert a hegemony of a direct tele-vision. This would mean privileging, in the entire installation, a number of indistinct fields which remain very important. Simultaneously, it would mean to privilege the luminous clarity of image formations which seem to be directly in contact with shadows, darkness, and background in an internal and purely optical kind of relation. In that way, one would aim in this performative event at the composition of a tele-vision qua spiritual miracle. One would direct a tele-vision towards this arrival or spectral appearance which creates essence and law: things gracefully appear and rise into the light. With this perspective, embodiment is also surrendered to a process of disintegration -- on the way towards the light, through light and shadow, clarity and obscurity -- first and last directed by a more or less essential optical code. This slide towards viewing Lozano-Hemmer's installation as hauntology [23] risks spiritualizing the visual and thereby losing the tactile sensation and the signaletic material of the "architact" in the installation, which is arguably the more important node of aesthetic intervention.

Shadowing Reflexive Gazes and Constructive Body Images

In its manner of affording interactivity, *Body Movies* may still retain an elevation and a verticality striving for clarity and illumination. There are perhaps several kinds of traces; for instance, in the relatively innocent joy taken in the pre-given heritage from Samuel Van Hoogstraten's seventeenth-century shadow dance, and in the appropriation of a traditional progression of shadow-play towards enlightenment. These seem traces of a desire to move interactively through an abstract, disembodied, and impersonal observation of objects (such as buildings and bodies) towards

representational sense or clearly illuminated meaning. However, even if *Body Movies* also remarks on this in order to question it, problematizations via more horizontal immanentizations are developed more intensely elsewhere and later in the series of relational architectures. For *Under Scan* inscribes itself in a comprehensive contemporary discourse of architecture and human body culture primarily in order to draw up and then problematize their representational sense or clearly illuminated meaning.

Hence there may well be traits of relational architecture which recall traditional and well-known emphases on a distanced (or tele-visual) and objective acquisition of knowledge. To be sure, one cannot avoid becoming aware that Lozano-Hemmer has constantly been at work on this. It is obvious that these media art installation projects are staging, openly and obviously, a set of representations of architecture and human bodies. This is the case all the way from the large, limpid animations of the human eye in *Surface Tension* (1993) through the extremely luminous and lifelike projection on public squares of the thousands of personal video-portraits incorporated in *Under Scan* (2005-) to even later projects such as *Sandbox* (2010) and *People on People* (2010). Likewise, these projects have not ceased pursuing a meaningful and explicit aim. They always also imply a consciously critical being at work with and against contemporary information art. On ethico-political and socio-cultural planes, they are perhaps not least taking on the task of facilitating a becoming aware of an otherwise covertly embedded information technology and the sociocultural implications of this, notably with regard to types of control, tracking, and surveillance on the hither side of the panoptic.

And yet, the singular import of Lozano-Hemmer's installations resides not in their reflective or constructive representation of human body images and buildings. Neither is it that they sometimes manage to open our eyes to reflexive and critical views on these representations. Nor even is relational architecture primarily about bringing epistemological clarity to the cultural body discourse and criticism of the present by laying bare its announced or desired meaning, that is, the sense it assumes or makes. Rather, Lozano-Hemmer's projects from the last half of the 1990s onward are increasingly occupied with investigating what mixed bodies and mixed embodiments could turn out to be once a performative and dynamic context of data space and life world is really at play. One cannot, then, but become aware of moving relationally at the limit of representationally sensible bodies and buildings. One could say that relational architecture, in its movements at the limit of representational hermeneutics, engages with but does not remain preoccupied with the sense of the world. For, prior to this, it also moves towards contact with a more originary production of presence, or a touch of the eventness of what is coming to presence. [\[24\]](#)

Thus, the later projects in Lozano-Hemmer's relational architectural information art only *appear* concerned with luminously true images of bodies and buildings, and these as one type of possible, deferred, and displaced effect. Such a project as *Under Scan* only *seems* concerned with a perceptive gazing or a confirmation of existing constructive body images. It must rather be approached from the angle of being concerned with sensation, quite specifically with respect to its haptic dimensions and events. This angle demonstrates a psychological and technical inventiveness with a certain performative capacity in its approach to both the information culture presently emerging with ubicomp and the tonalities of mixed embodiment emerging via our sensory engagement with this ubicomp culture.



Figure 7. Interactive exchange from the installation of *Under Scan* in Derby (2006). Photo courtesy of Rafael Lozano-Hemmer.

When engaging with this large-scale and very complex interactive installation for the public sphere, one is already sensing in the ambient, being surrounded so as to be touched and contacted from all around. One engages with the kind of mixed reality and context-awareness characterizing ubiquitous and pervasive computing. In other words, one is affected and then senses the embedded systems which are pointing fourteen very powerful and robotically controlled projectors to the position on the ground where they have predicted an interception by an interactive video-portrait of one's pedestrian trajectory across the public square (Trafalgar Square in London, for example). This one, among almost two thousand prerecorded interactive video-portraits of city inhabitants, is projected so as to be revealed within an interactant's shadow proceeding on the ground. So its haptic toning of embodiment and its disturbing touch of one's body image take place along with, and not least immanent to, one's view of the moving images of the video.

Along the way, and *in* one's being intent on looking at the objects themselves (the square, the buildings around, the traffic) or at the reflections of people and other things, something else is here always already at play. Something else is already taking place in the encounter with the sensor network embedded in the environment and the complex camera-based tracking system informing the main server in the installation where interactants and others around them are headed. The augmented optical space of *Under Scan* is inventively opened by a video portrait drawn up from the fourteen media servers that store and continuously manipulate all the interactive video sequences. One notes that this project already includes a complex correlation with a variable tactile mold. Likewise, one notices that, within one's gaze, a haptic space is opened in a modulating fashion. [25] Here and now in the square people predominantly engage with the "architact" of visibility. Delimiting any meaningful visual mimesis, they 'caress' the video-portraits, the shadows, and the square. Perhaps they do so quite affectionately, perhaps they act rather aggressively and forcefully (often jumping on and kicking at the video-portrait). Or they might well seek to flee and escape -- this probably as a response to their vague sensation of the abyss of otherness in the shadows (not sameness, nor a path towards individual or social identity-formation).

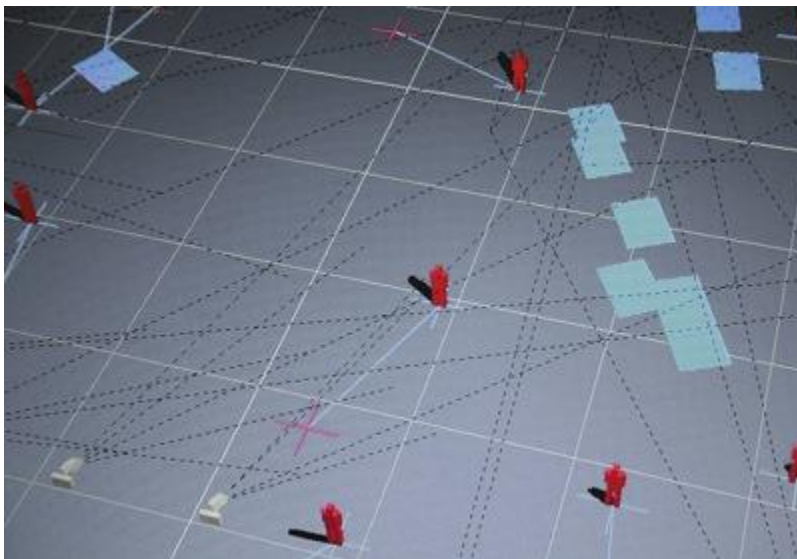


Figure 8. Screenshot from the main server: prediction of trajectories of movement (blue lines), interception by projected portraits (blue squares). From the installation of *Under Scan* in Lincoln (2005). Photo courtesy of Rafael Lozano-Hemmer.

Here it is emphatically not a matter of the recognizable portraits from the database of *Under Scan* and their equally recognizable moving images on the square. Within their traditional scopic regimes and within their gazes, the human interactants open a haptic space in which they are moved, on embodied and sensate planes, by a complex tactile mold. They are already moved by being in touch with the internally

(de)constitutive milieu of the gaze and its scopic regime. This is what makes them feel that their vision of images is in touch in varying ways with the body, the shadows, and the embodiments in and of the mixed reality square. For any one interactant, it is especially certain modulating disturbances of the purely optical vision that solicit this type of internalized optical-tactile modeling -- disturbances which do not immediately allow for representational and hermeneutic reduction.

The interactants feel in touch only in a relatively diverted sense in so far as they are actively calling up a realistic and contextually meaningful image on the square, for more of a touch of an alien memory is involved in *Under Scan*. It is rather a question of coming into contact via the reinvention of a more real haptic function *in* vision. Perhaps contact comes via the extremely fine, but slightly grainy differentiation of the modulation and juxtaposition of colors of a video portrait and the ground of the square. Light penetrates a mass unevenly and in broken tones, not dissimilar to what takes place in an encounter with chiaroscuro. Finely graded juxtapositions of colors continue to vary, indeterminately, between cold and warm color tones. These fort/da color movements culminate in a haptic close vision *in* the optic vision: a haptic space is opened to contend with the optical, inside it. It is not a question of invading the square, nor of drawing it out of itself, but rather one of mixing with it through another energy in coloration. For a human interactant, there are just ongoing series of discrete coloring events which invent contacts to another shadow, to others, and to another square via the spatializing energy *in* color, infinitely close to the projective fact and the pictorial *punctum*.

What captures people is not primarily the representational clarity of the luminous image projection, nor the respective hermeneutic horizons of the projected portraits and the everyday culture of the square. What catches and upholds the attention of passers-by is rather, first, that it is only the blocking by their bodies of one projection which has another come into presence and, second, that this other projection emerges precisely within the shadows of someone's embodiment. The modulation of shadows, their manifold and discrete toning of embodiment between light and darkness, especially at the silhouette contours and inside video portraits, tends towards an internal blurring of the value relations in the optic space, as in a slightly impressionistic performative experiment. This experiment reinstalls a haptic vision and a haptic space where the mixed reality square acquires depth and volume via the varying types of shadiness cast and arranged movingly upon it.

Mixed Skin-Stroke and Tactility in Live Shadow-Play

Originary touch and being touched, shadow of embodiment: it is not least the differentiated actualization of these two traits which relates *Under Scan* to the

extensive work today on approximating context-aware mixed realities. Relational architecture goes further and sets to work more carnally than a reinstallation of an optical-tactile modeling within the gaze and a discrete haptic variation of space immanent to vision. This installation project is not only characterized by the investigation of an expanded optical space, or a haptic spatialization immanent to this process. Rather, *Under Scan* is moving through a type of performative interaction. This interaction facilitates an overlaying and mixing of virtualized and actualized skins, and it approaches the constitutive and deconstitutive tactility [26] of embodiment via felt and actively lived caresses and strokes.



Figure 9. From the installation of *Under Scan* in London (2006). Photo courtesy of Rafael Lozano-Hemmer.

Thus relational architecture could in the first place be said to stress that in this epoch any capable media aesthetics must approach touch as singularly important on both the planes of normativized experience and a more heterogeneous practically lived experience. For the mixes of data spaces and physical spaces, virtual environments and real environments in information art call for the articulation of a media aesthetics in which interplays of psychological inventiveness (imaginative capability) and the capacity of the human body for corporeal-technical awareness sketch experiential frames for information art, if and when this is possible. The involvement of our embodiment in its entirety and the development of technological pervasiveness along with its frequent surpassings of human sensation and sensibility raise questions as to whether and how human embodiment can function as a dynamic, performative delimiter or "framer" of information art. [27] Attempts at aesthetic framing within a mixed reality hence draw radically upon the sensory apparatus, and due to the need for mutual relations between psyche and sensation it is now not least a matter of touch

qua the originary sense of contact and tactility. This is the exteroceptive sense capable of exploring *and* drawing limits, i.e., the sense permitting both inventively projective experimentation and incorporative approximations of what remains beyond registration.



Figure 10. From the installation of *Under Scan* in Nottingham (2006). Photo courtesy of Rafael Lozano-Hemmer.

In the second place, Lozano-Hemmer's relational architectural projects seem already to affirm that such an approximation must, if it is to stand a chance of arriving at a human perceptual experience, pass through the limit of the outside-inside visual culture and its light. As we sense in *Under Scan*, this approximation must pass through the shadow as an originary haptic visual delimitation of painting with color, of the image, and of a performative cinematics of surveillance cameras and interactive video portraits for mixed realities. For the interaction design Lozano-Hemmer has sought and found extraordinarily important inspiration in inventive artistic shadow-play, and in Victor Stoichita's thought-provoking monograph treating this play. [28] *Under Scan* manages not only to have us explore, touch, and caress with the eye as with the hand in the process of drawing up contours of embodiment via a shadow, finding again the origin of the body image in a seemingly synaesthetic movement. It also brings a mixed shadow into strict proximity to our bodies and thus makes us aware that this seemingly synaesthetic movement inclines asymmetrically towards a discrete break with our gazes and vision. In such discrete infractions or breaches, a multiplicity of active, live strokes and beings touched of the skin of embodiment exist, in an extended sense, where touch works alongside and against originary tactility. *Under Scan* makes us aware that within the interaction with the mixed shadow of the body lies an affectively explorative embodiment of tactility. Here Lozano-Hemmer's project is no longer concerned with uninstalling a purely

optical representation via haptic vision. Rather, it seeks to afford infractory passages to a mixed manual space for movement, one where 'the between' of skin-strokes and the tactile do not mime but unfold an engaging interactivity of mixed embodiment with originary tactility at play.



Figure 11. Interactive exchange from the installation of *Under Scan* in Leicester (2006). Photo courtesy of Rafael Lozano-Hemmer.

Shadow-play, an inventive approach via mixed shadows to an interactivity for both individuals and loose social constellations, engages inhabitants of a city in a diverse and ad hoc gathered social body so as to enter into a very lively investigation of each other and the media and technics of an emergent ubicomp culture. Remarkably, these urbanites passing by come to engage, on their own and with many others, in inventive, experimental, and curious play with embodiment. They do this even though it takes place in a mixed reality, and although shadow-play involves relations across the entire register from self- to hetero-reference, from identificatory self-staging to being exposed to monstrosities, or from the most obvious narcissistic *jouissance* to being lost in abyssal fear and trembling in proximity to more or less radical otherness. [29] This remains a remarkable phenomenon since one can trace, without difficulty, a very broad range of phobic reactions to technology as monstrous otherness all the way through 'our' cultural and philosophical past, just as a certain technophile utopianism has also left its evident imprints. The certain interest of Lozano-Hemmer's projects, then, is to witness today another juxtaposition and mixed co-emergence of technology and culture.

The exchanges with shadow-play in *Under Scan* do remarkable work, in toned-down and discrete infractions of (relatively appropriate) haptic visions of shadows as one's

own and others', towards bringing us alongside a recent, but undeniable fact respecting our augmented and mixed life form. Through the shadows on the move in *Under Scan*, the people on the square edge closer to a dissolution of the conventional borders of their skin, blurring distinctions between outside and inside, private and public, identificatory unity and multiplicity. This happens via the virtualization of their bodies, but also via the emergence of a complementary interplay, in their embodiments and the real environment, among locative media, signaleptic telepresence, and ubiquitous computing. Perhaps we already seem to know quite well the blurrings and dissolutions of borders characteristic of the virtual environments of the Internet and the PC- and GUI-based types of interaction. But relational architectures come along with a much less known emergence of ubiquity-effects today. *Under Scan* already operates after an out-of-the-box and post-GUI 'physical turn.' It thus introduces a complementary interplay which connects interactants with a different kind of media intimacy, a drastically extended mobility of ICT, a far-reaching and multiplicitous distribution in ad hoc networks, as well as a much more noticeably material dimension of embodiment alongside and meshing with 'embodied virtuality' qua more or less embedded, context-aware technics in the real environment.

The citizens' shadow-play via haptic vision and embodied movement of the sensible implicates them in an investigation of couplings among the public sphere, media intimacy, and corporeal technical pervasiveness. [30] It concerns embodied movements, sensations of contours drawn, and haptic visions of shadows which move and are moved in interaction with others and otherness. One is perhaps quite astounded at meeting so many surprising movements and moving images of people who gather and disperse in an extensive shadow-play with actual and virtual planes in a process of mixing. One occasionally notes a well-nigh Bakhtinian carnival arising spontaneously on a small scale among the interactants. If you were among these people, you might be passionately enthused in a gathering or spread in emotional distantiation, but you would then in each case already have been moved shadow-wise from sensation to corporeal affect whether this be on one or the other side of the distinction between the individual and social.

Approaching *Under Scan* via a sentient and tactful haptic shadow-play which involves the limits of our individual and social skin also enables one to note that the tendential 'physical turn' in Lozano-Hemmer's work implies a strategy for performative participation which shifts weight from an earlier work with and on elevated light and virtual lines of communication to a more actual and embodied gathering in the later projects. Thus, Lozano-Hemmer seems to be responding to certain shortcomings in a strictly telecommunicational approach, perhaps now overestimated in the art world and appropriated in the work by large corporations on personalized consumer

expenditure. In this respect, not entirely unlike *Body Movies* and several other later installation projects, *Under Scan* can thus be considered as an initial exploration in performative interaction design of ways to afford a 'gathering' or a 'communion,' without overt religious overtones and understood as a contingent social and aesthetic constellation -- a "coming together" as the composer Frederic Rzewski calls it. [31] Via this gathering, *Under Scan* opens onto the simple sensual joy at the chance to engage in an embodied interactive participation and coming together. The wager here would be that insofar as decidedly socio-aesthetic lived experiences become rarer, distanced, affectively blunted, disembodied, and infiltrated by the individualized consumption proper to an experience economy -- due to virtualized telecommunication, urban design, flexible hours and work-patterns, among other things -- the facilitation of events qua intelligent, alternative, and creatively participatory comings together in a skin-stroking and carnally mediated sense becomes markedly more interesting (and more difficult to bring about).

This should form one's point of entry to Lozano-Hemmer's self-avowed attempt to make a distinction and yet insist on the mutual implication of virtual and relational architecture. Virtual architecture would arguably be drawn towards simulation, miniaturization of the inhabitants immersed in a building, and towards a dematerialization of the body. Relational architecture would in contrast tend towards dissimulation, amplification of the participant inhabitant, and towards a certain dematerialization of the milieu. In short, Lozano-Hemmer's projects will always necessarily draw on both, but later projects such as *Under Scan* increasingly depart from the virtually discrete, personalized, and individualized experiences of interactivity. This gesture is necessary in order to begin emphasizing a physical turn that not only actualizes embodied virtuality but also moves towards more directly embodied and shared experiences of touch and being in touch in social constellations. In these, people actively take on different, surprising, and altogether unknown roles, thanks to the complex and multiplicitous interactive feedback loops enabled by a certain intimacy with shadows, physical proximity, and concrete embodied moves.

Under Scan is part of a wider process in which installations of relational architectures have not ceased trying out new performative strategies for an interaction that traces oscillations between virtuality and actuality, our digitally electronic and more analog, carnally mediated modes of existence, as well as the distantiating disappearance and the approximative coming to presence of the citizen in contemporary urban environments. Lozano-Hemmer's work thus partakes of the inventive art of the present which can compel us to grapple with the immateriality as well as the materiality of electronic energy, and which is capable of giving us a sensory or even sensual experience of their spacing or seam, sometimes powerfully disturbing and at other times enjoyable or just pleasurable in its beautiful and playful form of social

engagement with haptic relations to images, shadows, as well as their immanent tactility. For the modern citizen's identity formation, spectacular light shows played an important role throughout the 19th and 20th centuries (not just in Albert Speer's national socialist variant of a temple of light, but also in a more general socio-cultural sense, all the way to Pink Floyd concerts) by giving a tangible form to what was then affectively disturbing in the imperceptibility of electrical energy. Lozano-Hemmer's installations -- with their robotic searchlights, tracking systems, haptic vision, touching shadow-play, and blindly explorative contact with tactility -- are quite far-reaching in attempting to respond to the need we feel to make a withdrawn and evasive electronic energy not just haptically visual, but also tangibly present.

In projects such as *Under Scan* (or *Re:Positioning Fear*, *Body Movies*, and *Frequency and Volume*), the tactile is given back to the skin and the hand. This happens in a mixed, energetic interactivity whose 'coming together outside' and 'brush with an immanent outside' from time to time achieves an unexpected speed of movement. Being a speed which the eye cannot follow or track, new corporeal lifelines are drawn up for emergent individuals and social constellations. What is at stake is not primarily a miming movement among the interactants' shadows of embodiment. This does not concern an appropriative representational integration of the shadow that delimits an interactive video portrait. It rather relates to tactile traversals of an impersonal embodiment which moves and is in movement in the shadows, so that individual subjects and organized social groups cannot follow in a haptic vision but can only exceed or exscribe themselves in tactility. Insofar as the relational architecture of *Under Scan* becomes affectively gripping or riveting, it happens because its interactive dimension seeks contact through shadow-play with an impersonal embodiment in unpredictable, sudden, and rapid movement. At times, such contact is sought when individuals and social constellations change directions, when they twist and turn fast, break off from themselves, or split by streaking towards contact with a mixed skin-plane immanently outside. At other times, contact is sought by individuals and social constellations returning around their mixed skin borders in tangential, auto-affective fashion, via more or less caressing, forcefully peripheral, or whirling tactile strokes.

Mostly, the shadow-play in Lozano-Hemmer's installation furnishes openings for varied individual and social passages beyond organized and organic representation simply by having the movements of the interactivity problematize the virtual and actual bodily contours of the participants. The shadow-play moves the interactants in a bodily fashion so that the bodies no longer have regular contours, but at most a partially blurred outline which is in gestation as a more or less broken or intricate orbiting ribbon, a bow, or an envelope. [\[32\]](#) This leads the people involved through augmentations to mixed skin-strokes which are other and otherwise prior to their

propriety. An impersonal embodiment of originary tactility is here pursued as an expressive or expressionistic space, at the points where the interactants' shadows in a mixed reality are constantly breached in touch. This may happen as shadows are blurred in mutual imbrications, so that more remains at stake than identificatory delineation of body contours and less than the creation of a well-defined skin surface.

There is thus in *Under Scan*, once it is brought to life in performative interaction, a de-limitation of the organized body or bodies -- via affirmations of the fracturing planes and lines of the shadows. That is, a pursuit in strokes, at the moving points where one may become different, both on one's own and in play with others, and where an impersonal, mixed embodiment sets off in a touching movement, perhaps infinite. To be sure, in the mix of the virtual and the actual square, the affordances of lines of movement before and beyond organized and organic representation almost always call up movements of the interactants' bodies which concern identifiable animations of anthropomorphic bodily contours. Perhaps the interactants in Liverpool and London experienced embodiments as a number of vague or indistinct zones in their existing bodies. This, then, in each case appears to blur a clearly delimited skin or form for their bodies, but almost always the strong movement of the body mass itself, which is implicit in this form, is avoided. Such recoil most often leads in the direction of a rediscovery of stabilized, delimited, organized body formations, socially as well as individually.

Within the mixed movements of the shadows in *Under Scan*, however, something more and other is undeniably at play. Every such rediscovery through shadow-play of one's own body form or of an organized social gathering of bodies draws upon prior compositional skin-strokes or traits. They carry with them an existential and intense realism -- including an opening for bodily deformation (also beyond luminous disaggregation). Here it is not just a matter of a certain animated blurring of the body formation, but also, first, of a touch of something indistinctly other in an inherently embodied register -- a bodily indiscernability of the line of life in its further proceedings. This can very well be a matter of an event in the corporeal line of life which suspends or exceeds the organizational by opening for or leading towards mixed relations -- with other bodies in the abstract, with other people, or with various other life forms (animals, biospheres, nanospheres, technical tendencies, etc.).

Streaks of such an event in the interactive manual spaces in Lozano-Hemmer's installation project emerge when the participants are set in such rapid and swerving bodily movement that the forces of embodiment exceed organism and organization. This happens, for instance, when the comings into contact with a multiplicity of the other shadows in *Under Scan* acquire the character of a great many demanding obstacles. These continue to demand both dynamic changes of direction in lived and live embodiment and new directions for interactive manual strokes as well as for

tangible lines along the skin surfaces in a mixed reality. It can then become a matter of a vitally lived and intensified experience where a corporeal line of life comes to presence, for the individual or for the configuration of interactants, through the rigging of a new type of manual and epidermic aggregates. But just as the interactants in *Under Scan* disperse as a contingently upheld manual aggregate or a tangible "coming together," whether in the process or later on, so these event-specific streaks of an other, impersonal embodiment may end up stressing the way in which the forces of the mixed bodies in their roundelay or vortex make an organization come apart. In other words, there is, not least *in* the performance of *Under Scan*, a flat and frenetically lived interaction-line which fosters a bare, bizarre, and intense life. This bizarre and bare embodiment has always already run from the organized and organic, and Lozano-Hemmer's projects seem to facilitate a moving passage towards a type of inorganic vitality in the lacing of individual body contours and the social throng.

Notes

[1] "Relational architecture" is Rafael Lozano-Hemmer's own notion, defined in short as "the technological actualization of buildings with alien memory." For further treatment of this in an early interview, see Geert Lovink, "Interview by Geert Lovink," in *Vectorial Elevation*, edited by Rafael Lozano-Hemmer (Mexico City: Conaculta, 2000), 48-67, 55.

[2] With respect to Lozano-Hemmer's projects I refer in general to my own encounters with a number of these during the last decade, but also more specifically to the presentations of text, images, and videos on the artist's web site. I remain indebted to Lozano-Hemmer for his generosity in making materials available for this research article, and for his recent presentation at a conference in Copenhagen arranged by my Nordic research network, "The Culture of Ubiquitous Information."

[3] Lozano-Hemmer defines an 'anti-monument' as "an alternative to the fetish of the site, the fetish of the representation of power." Cf., Priamo Lozada, "Rafael Lozano-Hemmer - Interview By," *Felix 2*, no. 3 (2003): 18-21, 19. See also the treatment in Alex Adriaansens, and Joke Brouwer, "Alien Relationships from Public Space: A Winding Dialog with Rafael Lozano-Hemmer," in *Transurbanism* (Rotterdam: V2_Publishing/NAI Publishers, 2002), 138-158, 144.

[4] The notion and the practice of shadow-play evidently remain deep inspirations in the work of Lozano-Hemmer. Shadow-play not least serves to have interactants adapt the interface of a given installation quickly and in an intuitive manner so that it does not become too distracting. Shadow-play affords interactions with an asynchronous, atopian, shadowy body coming into presence at different scales and with angelic and demonic characteristics both. Lozano-Hemmer remarks on his deployment of this interaction design in an earlier interview: "... my initial desire was to use artificial shadows to generate questions about embodiment and disembodiment, about spectacular representation, about the distance between bodies in public space, and so on. It is clear that those are my obsessions and most people participating in the piece probably are

reflecting on something completely different, which is great." See Adriaansens and Brouwer, 143. I return to treat of shadow-play in greater detail in the two final sections below.

[5] I am referring to Mark Weiser's seminal treatment of "embodied virtuality" in the early papers concerning his vision for ubiquitous computing. See Mark Weiser, "The Computer for the 21st Century," *Scientific American* 265, no. 3 (1991): 94-104; Mark Weiser, and John Seely Brown, "The Coming Age of Calm Technology," <http://nano.xerox.com/hypertext/weiser/acmfuture2endnote.htm>. For a later and more extensive treatment of the implications of this vision for situated interaction, unfolded via approaches in interaction design and a social phenomenology of the life world, see Paul Dourish, *Where the Action Is : The Foundations of Embodied Interaction* (Cambridge, Mass.: MIT Press, 2001).

[6] The cultural theoretical, practical, and aesthetic implications of this currently ongoing development of a third wave of computing are far from clear. For two early and partial treatments see Malcolm McCullough, *Digital Ground : Architecture, Pervasive Computing, and Environmental Knowing* (Cambridge, Mass.: MIT Press, 2004) and Adam Greenfield, *Everyware : The Dawning Age of Ubiquitous Computing* (Berkeley, CA: New Riders, 2006). For a comprehensive anthology addressing these issues see also Ulrik Ekman, ed. *Throughout: Art and Culture Emerging with Ubiquitous Computing* (Cambridge, Mass.: MIT Press, forthcoming 2012). With respect to the character of the new interaction designs arriving in tandem with this development, of which Lozano-Hemmer's projects could be said to present very interesting exemplars, see the special issue of the *Fibreculture* journal concerned with this. Cf., Ulrik Ekman, "Editorial: Interaction Designs for UbiComp Cultures," *Fibreculture*, no. 19 (2011): 1-25. <http://nineteen.fibreculturejournal.org/>

[7] The mention here of the notion of 'mixed reality' concerns the unfolding today of contextual designs involving ubiquitous, pervasive, or ambient technics informed by a paradigm of dynamic relations between the virtual and the actual. I treat of different ways to approach this at more length in my introduction to *Throughout*, just as I draw upon this notion in Ulrik Ekman, "Irreducible Vagueness: Mixed Worlding in Diller & Scofidio's Blur Building," *Postmodern Culture* 19, no. 2 (2009). Here it may suffice to remark that Paul Milgram and Fumio Kishino's early work provides one very useful and frequently cited definition. On this path one would thus think of a virtuality continuum of which mixed reality (MR) is a subset. This involves as components the virtual environment (VE), augmented virtuality (AV), augmented reality (AR), as well as the real environment (RE). See also Paul Milgram, and Fumio Kishino, "Taxonomy of Mixed Reality Visual Displays," *IEICE Transactions on Information and Systems* E77-D, no. 12 (1994): 1321-1329. Much like other researchers in this field, I tend to refer to augmentation (AV and AR) via the definition presented in the influential work of Ronald Azuma, according to whom an augmented-reality system is one that (1) combines the real and the virtual, (2) is interactive in real time, and (3) is registered in three dimensions. See also Ronald T. Azuma, "A Survey of Augmented Reality," *Presence: Teleoperators and Virtual Environments* 6, no. 4 (1997): 355-385.

[8] Although just mentioned in passing here, I am drawing upon the genetic notion of 'individuation' as thought by Gilbert Simondon: "Individuation corresponds to the appearance of stages in the being, which are the stages of the being. It is not a mere isolated consequence

arising as a by-product of becoming, but this very process itself as it unfolds; it can be understood only by taking into account this initial supersaturation of the being, at first homogeneous and static, then soon after adopting a certain structure and becoming -- and in so doing, bringing about the emergence of both individual and milieu -- following a course in which preliminary tensions are resolved but also preserved in the shape of the ensuing structure; in a certain sense, it could be said that the sole principle by which we can be guided is that of the conservation of being through becoming." Cf., Gilbert Simondon, "The Genesis of the Individual," in *Incorporations*, edited by Jonathan Crary and Sanford Kwinter (New York: Zone, 1992), 296-319, 301. Relatively early, Gilles Deleuze's thought is inspired by this: "Gilbert Simondon has shown recently that individuation presupposes a prior metastable state -- in other words, the existence of a 'disparateness' such as at least two orders of magnitude or two scales of heterogeneous reality between which potentials are distributed. Such a pre-individual state nevertheless does not lack singularities: the distinctive or singular points are defined by the existence and distribution of potentials. An 'objective' problematic field thus appears, determined by the distance between two heterogeneous orders. Individuation emerges like the act of solving such a problem, or -- what amounts to the same thing -- like the actualisation of a potential and establishing of communication between disparates." See Gilles Deleuze, *Difference and Repetition* (New York: Columbia University Press, 1993), 246. See also the thought-provoking reconsideration of Simondon undertaken in Alberto Toscano, *The Theatre of Production : Philosophy and Individuation Between Kant and Deleuze* (New York: Palgrave Macmillan, 2005).

[9] Weiser and John Seely Brown placed quite some emphasis on the calmness and the tacit dimension of ubicomp, although a more nuanced understanding of this remains possible. Lozano-Hemmer's projects might well be approached as one interesting kind of immanent critique of ubicomp cultures, at one and the same time disturbing its calm and living on inside it. Lozano-Hemmer's mode of operation is then to be characterized as a consistent work with and against the most advanced technology available, in the sense that he approaches technology as an unavoidable dimension of the socio-cultural in which it is the media-artist's role to develop or misuse it in order to break with stereotypes, and to articulate new technological idioms. Compare Lovink, 59. See also the more provocative manifesto: Rafael Lozano-Hemmer, "Perverting Technological Correctness," *Leonardo* 29, no. 1 (1996): 5-15. For a set of critical ethical considerations of the development of ubicomp, see Adam Greenfield, "Some Guidelines for the Ethical Development of Ubiquitous Computing," *Phil. Trans. R. Soc. A* 366 (2008): 3823-31. For an alternative approach to ubicomp interactivity, affirmative and yet critical of the notion of "calm computing," see Yvonne Rogers, "Moving on from Weiser's Vision of Calm Computing: Engaging UbiComp Experiences," in *UbiComp 2006 : Ubiquitous Computing : 8th International Conference : Proceedings*, edited by Paul Dourish and Adrian Friday (Berlin: Springer, 2006), 404-421.

[10] I have in mind the general transcendental euphoria characterizing the discourse concerning virtuality in the first half of the 1990s, whether in the VR research community or in popular phenomena such as the Wachowski brothers' *Matrix* movie trilogy. More specifically, I am referring to the transcendental understanding of virtuality (qua perfectly simulative and immersive VR) that comes to motivate Katherine Hayles important book on the history of cybernetics, i.e., that kind of disembodied posthumanism (associated with the work of Marvin

Minsky, Hans Moravec, and Ray Kurzweil) which Hayles criticizes. See N. Katherine Hayles, *How We Became Posthuman* (Chicago: University of Chicago Press, 1999). In this article I am thus seeking to inscribe Lozano-Hemmer's work not so much in a move towards strong or complete AI, but rather in a different kind of effort, one which insists quite intensely on an embodied approach to virtuality as a concrete abstraction.

[11] The reader will no doubt find in this article a considerable number of traces of the debt owed to a Deleuzian mode of being at work in relation to the impersonal field of a transcendental empiricism, albeit supplemented with a different attachment to social and individual experience in a general sense.

[12] For a survey of technical and cultural engagements with ubicomp context-awareness, see my introduction to *Throughout*. See also, for example, the accounts in Paul Dourish, "What We Talk About When We Talk About Context," *Personal and Ubiquitous Computing* 8, no. 1 (2004): 19-31; Hans W. Gellersen, Albrecht Schmidt, and Michael Beigl, "Multi-Sensor Context-Awareness in Mobile Devices and Smart Artifacts," *Mobile Networks and Applications* 7, no. 5 (2002): 341-351; Seng Loke, *Context-Aware Pervasive Systems* (Boca Raton, FL: Auerbach Publications, 2006); Thomas Moran, and Paul Dourish, "Introduction to This Special Issue on Context-Aware Computing," *Human Computer Interaction - Hillsdale* 16, no. 2 (2001): 87-96; Albrecht Schmidt, Michael Beigl, and Hans-W. Gellersen, "There Is More to Context Than Location," *Computer & Graphics* 23, no. 6 (1999): 893-901.

[13] In my approach to the sensations traversed in interactions involving Lozano-Hemmer's projects I am implicitly referring to an attunement akin to that in Gilles Deleuze, and Félix Guattari, "1837: Of the Refrain," in *A Thousand Plateaus* (Minneapolis: University of Minnesota Press, 1987), 310-350. I am also referring to a mode of being in touch akin to that found in Gilles Deleuze, *Francis Bacon : The Logic of Sensation* (Minneapolis: University of Minnesota Press, 2004).

[14] Throughout this article I refer, indirectly, to 'the body' and 'embodiment' with a view to the distinction between these which Katherine Hayles deploys. That is, "the body" here refers to an abstract, generalizing, and normative concept which grasps the body as a cultural construct, while "embodiment" indicates an individual's unique experiences of embodiment as an experience lived from the inside -- including the entire span from one's own sensations and affects to 'textures of life' on different biological and physical planes. Cf., N. Katherine Hayles, "Flesh and Metal: Reconfiguring the Mindbody in Virtual Environments," *Configurations* 10 (2002): 297-320. Here I am particularly interested in a further investigation of discriminations today among (1) our experience (*Erfahrung*) of a generalizing and normatively trendsetting design of the body, (2) our lived experiences (*Erlebnis*) of embodiment, and (3) singularly living embodiment and its contingently possible mix or augmentation with (in)human complexity and otherness, specifically with respect to implications and ramifications making themselves felt along with Rafael Lozano-Hemmer's projects.

[15] This remainder of transcendental and disembodied enlightenment is perhaps more easily recognized in some of Lozano-Hemmer's many other broadly received projects, such as *Vectorial Elevation* (2000), his breakthrough which aimed at a celebration of the arrival at a

new millennium on the impressive public Z³calo Square in Mexico City. In this project Lozano-Hemmer presented a website allowing anyone with access to the Internet to undertake architectural redesign of urban space in an epoch characterized by globalization: an online 3D-interface enabled the creation of a myriad of individual designs for *sculptures of light above* the historical centre of the city. These designs were then -- via servers as well as custom made software and technical equipment -- presented performatively via 18 robotic searchlights placed around the public square, each one powerful enough as light beams to be seen within a radius of 15 kilometers.

[16] Cf., William Gibson, *Count Zero* (New York: Arbor House, 1986); -- -- -- , *Mona Lisa Overdrive* (New York: Bantam Books, 1988); -- -- -- , *Neuromancer* (New York: Ace Books, 1984).

[17] For a monographic treatment of virtual art, see Oliver Grau, *Virtual Art : From Illusion to Immersion* (Cambridge, Mass.: MIT Press, 2003). See also the broad art historical accounts in Margot Lovejoy, *Postmodern Currents : Art and Artists in the Age of Electronic Media* (Ann Arbor: UMI Research Press, 1989); Margaret Morse, *Virtualities : Television, Media Art, and Cyberculture* (Bloomington: Indiana University Press, 1998); Christiane Paul, *Digital Art, World of Art* (New York: Thames & Hudson, 2003); Michael Rush, *New Media in Late 20th-Century Art*, The World of Art Library, (London: Thames & Hudson, 1999).

[18] Here I am referring to Jacques Derrida, "White Mythology: Metaphor in the Text of Philosophy," in *Margins of Philosophy* (Chicago: University of Chicago Press, 1982), 207-272; Martin Jay, *Downcast Eyes: The Denigration of Vision in Twentieth-Century French Thought* (Berkeley: University of California Press, 1993).

[19] Lozano-Hemmer is, of course, very conscious of the ways in which his work inscribes itself in a well-established tradition of the art of light and the extensive metaphors of light in the discourses of cultural studies and studies of technology. For his own reflections on this, see Lovink, 49-53. See also the interesting treatments of this problematic in Erkki Huhtamo, "Re:Positioning Vectorial Elevation, Media Archeological Considerations," in *Vectorial Elevation*, edited by Rafael Lozano-Hemmer (Mexico City: Conaculta, 2000), 99-114; Eric Davis, "Millennial Light," in *Vectorial Elevation*, edited by Rafael Lozano-Hemmer (Mexico City: Conaculta, 2000), 241-259.

[20] See Manovich's treatment of a poetics of augmented space in Lev Manovich, "The Poetics of Augmented Space," *Visual Communication* 5 (2006): 219-240.

[21] Cf., Mark Weiser, "The Computer for the 21st Century."

[22] *Body Movies* is in that sense already an embodying and contextualizing departure by Lozano-Hemmer from such an earlier project as *The Able Skin* (1997) with its blindingly clear introjection of an existing building as a pure image in a 3D VR world. Or you might say that *Body Movies* is of special interest due to its emphasis on an exploration of the augmented reality side of mixed realities. Inversely, *The Able Skin* remains even today worthy of reconsideration due to its further exploration of the dimensions and events of an augmented

virtuality. For this is something still tendentially left too underdeveloped today in the engagements with mixed realities during the development of ubicomp, pervasive computing, ambient intelligence, and things that think.

[23] My implicit reference respecting 'haunting' is to Derrida's tracing of a certain "hauntology" in Marx' writings, cf., Jacques Derrida, *Specters of Marx : The State of the Debt, the Work of Mourning, and the New International* (New York: Routledge, 1994). For a text on haunting treating more directly of image media, see Derrida's remarks in Jacques Derrida, "Spectrographies," in *Echographies of Television : Filmed Interviews*, edited by Jacques Derrida and Bernard Stiegler (Cambridge: Polity Press, 2002), 113-134.

[24] I am alluding to Jean-Luc Nancy's extensive remarking anew of this trace in Jean-Luc Nancy, *The Sense of the World* (Minneapolis: University of Minnesota Press, 1997). As regards both the delimitation of hermeneutic representation in relation to the production of presence and the notion of coming to presence, I am referring to Hans Ulrich Gumbrecht, *Production of Presence: What Meaning Cannot Convey* (Stanford, Calif.: Stanford University Press, 2004); Jean-Luc Nancy, *The Birth to Presence* (Stanford: Stanford University Press, 1993).

[25] My use of the notion of the haptic passes through Gilles Deleuze's rethinking of this aspect of Alois Riegl's art historical work. Cf., Gilles Deleuze, *Francis Bacon : The Logic of Sensation*, 99-113. I deviate, however, from Deleuze's privileging in aesthetics and sensation of a transcendently empirical color vision, whose temporal, variable, and continuous modulation spaces in its infinite approximation to a pure state of pictorial fact qua a reconstitution of a haptic function of vision. I affirm Deleuze's movement towards a new Egypt. But I do not find that this primarily takes place via a unique composition of color, to the point of having the event become eternal. Rather, I find that the emphasis in aesthetic *Erfahrung* and *Erlebnis* must stay with a pursuit through touch to relational tactility; that the senses are singularly plural in their distribution and do not immediately permit synaesthesia (for instance, between vision and touch); that this implies a certain uncomfortable acceptance of a merely hopeful and fumbling exploration on the tactile plane as well as moments of blindness and irreducible lack of insight; and, finally, that a new Egypt unfolds itself in an infinitely discrete withdrawal during its coming to presence as relief, where any impassioned, live touch is every time in contact only with the other of tactility.

[26] In my treatment of tactility I agree with Mark B. N. Hansen on the import of distinguishing between tactility qua a distinct sense in itself (*touch*) and tactility qua a protosensate capacity, i.e., between the sense of touch and ordinary tactility. Hence both Hansen and I draw upon Didier Anzieu's privileging of the tactile as at once the most primitive sensory formation and the sensory-transcendental marking of difference in which originates the sensible as such. However, I do not find that tactility is necessarily organized as 'ours,' nor that is reversible in the ways and to the extent that Hansen claims. Here I diverge from Hansen's revitalization of Maurice Merleau-Ponty as a main source of inspiration: a divergence concerning another kind of emphasis on both irreversible and non-systematic intersensory difference on the hither side of phenomenological presence and on openings, perhaps irreversible, onto animality and in-human life forms. For Hansen's treatment of "primordial" tactility, see Mark B. N. Hansen, *Bodies in*

Code : Interfaces with Digital Media (New York: Routledge, 2006), 67-71. See also Didier Anzieu, *The Skin Ego* (New Haven: Yale University Press, 1989).

[27] The notion of the body as a framer of information is treated more extensively in Hansen's two latest books, cf., Mark B. N. Hansen, *New Philosophy for New Media* (Cambridge, Mass.: MIT Press, 2004); Hansen, *Bodies in Code*. I agree with Hansen as regards raising the question of a bodily capacity for imaging (although here Hansen works with a Bergsonian and universal concept of images rather than a more distinctly delimited and phenomenological one), just as I appreciate his mode of operating with 'bodies in code,' not least the notion that it is tactility which introjects technics in human life. However, as a life form I am less anthropocentrically oriented and find that the task remains to pursue the question of codes already *in* embodiment, just as these codes seem to me to include immanently the in-human other, all the way through autoimmune embodiment to the ahuman. In other words, I miss in Hansen a more extensive account not only of the way in which 'we' introject technics when being in touch, but also of the way in which 'we' always already touch ('ourselves' otherwise) and are thus exposed and disseminated ecotechnically, without this 'we' having any necessarily human schema for vital self-organization.

[28] Cf., Victor Ieronim Stoichita, *A Short History of the Shadow* (London: Reaktion Books, 1999). Lozano-Hemmer repeatedly refers to this source in several interviews, not least as regards its sixth chapter which, with a slightly Benjaminian echo, bears the title "Of Shadow and Its Reproducibility During the Photographic Era" (187-199). For three particularly rewarding interviews with Lozano-Hemmer, see JosÃ© Luis Barrios, "A Conversation between JosÃ© Luis Barrios and Rafael Lozano-Hemmer," <http://osdir.com/ml/culture.internet.nettime/2005-10/msg00051.html>; Lovink; and Alex Adriaansens and Joke Brouwer.

[29] One should note that for Lozano-Hemmer the shadow is not an alias for the body, but rather a disembodied body part. In that sense, "tele-absence" benefits from the fact that it remains impossible to position the body within the shadow: it is a celebration of where the body is not. Cf., MarÃ­a FernÃ¡ndez, "Postcoloniality in the Spotlight," in *Vectorial Elevation*, edited by Rafael Lozano-Hemmer (Mexico City: Conaculta, 2000), 133-164, 140-141. The critical work on Lozano-Hemmer's projects by other researchers affirms their hetero-relationality. See, for example, Kriss Ravetto-Biagioli's treatment of being shadowed by the images in Lozano-Hemmer's installations as a matter of a decidedly uncanny experience, in Kriss Ravetto-Biagioli, "Shadowed by Images: Rafael Lozano-Hemmer and the Art of Surveillance," *Representations* 111, no. 1 (2010): 121-143.

[30] Lozano-Hemmer has, since the beginning of the new millenium, been increasingly preoccupied with installations which draw contemporary public and private spaces into an interplay concerning a new sense of *agora* for a mixed and globalized reality. Relational architecture thus also inscribes itself in the broader context of the media art engaging with this problematic.

[31] The reference to Rzewski is Lozano-Hemmer's and appears regularly in interviews. See, for instance, the following remarks in an interview with Lovink: "The installations tend to be ephemeral interventions where the public becomes an actor through interactivity, and they are

closer to perpetration than to preservation. I am also particularly interested in the fact that theatre, concerts and performance art are direct, shared experiences where people actively assume different roles, thanks to the 'wideband' feedback that is possible with collective closeness. Composer Frederic Rzewski called this essential pleasure of the performing arts 'coming together.'" Cf., Lovink, 64-65.

[32] Here I am proceeding towards a notion of the psychologically inventive work on embodiment which is very close to Didier Anzieu's "skin ego." In that sense, I am pointing to a plane in interactive shadow-play which Lozano-Hemmer's installations solicit. This pertains to the real in fantasy, i.e., it is one drawing on fantasy and imagination as both a bridge and a screen between the body, other psyches, and the world. On that plane, the psyche is working with both its supports, in the biological body and the social body, towards a drawing up of the ego border and the skin border as a sufficiently stable envelope, i.e., a functioning and mutual delimitation between inner psychic world and external perceptual world. Anzieu assumes that the relations of support are mutual, such that the organic and social life of humans almost constantly must seek support in the individual psyche, just as the psyche cannot do without the support from a living body and a living social group. My emphasis here is on pointing to a certain asymmetry in favor of the other and the otherness of living embodiment, that is to say, a certain finitude and emergent mortality at stake in any living body envelope. The skin ego is treated in greater depth in Anzieu's remarkable work bearing that title. For a critical-historical approach to this work, see also Didier Houzel, "The Concept of Psychic Envelope," in *Psychic Envelopes* (London: Karnac Books, 1990), 27-58.

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