

Connecting Realities: Rafael Lozano-Hemmer's Pulse-based Works

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ABSTRACT

Rafael Lozano-Hemmer is a Mexican digital artist recognized for creating large-scale theatrical interactive installations for museum and public spaces, as well as small-scale works with custom-made interfaces and digital technologies. Since 2006 this artist has created eight works that require the physiological input (pulse and heartbeats) of the audience in order to be completed. Light in the pulse-based works of Rafael Lozano-Hemmer is the main vehicle that serves to visualize heartbeats outside the realm of the body, facilitating its reterritorialization and conceptualization as a malleable material that can cross the boundaries of the skin, expanding it to other three-dimensional extents in which new spatiotemporal relationships and interactions between participants and the surroundings are produced. This paper explores how these rhizomatic digital installations create a community conscience and engagement between different people in various spaces dedicated to art, while challenging our conception of reality.

KEYWORDS

Interactive Art; Installation; Rafael Lozano-Hemmer; Space; Time; Pulse; Heartbeats; Biometric.

1 | INTRODUCTION

Light has been conceived as one of the major sculptors of space by marking, occupying, illuminating and reflecting specific areas and manipulating its perception (Zyman, 2006). Since the 1930s artists have been exploring the different phenomenological, interactive and performative qualities of light spaces. László Moholy-Nagy created the *Light-Space-Modulator* in 1930, which is a kinetic sculpture that explores the phenomena of light and movement, altering spaces by means of reflected light through different materials such as glass and plastic. He also had a vision of a “dynamic light architecture” where searchlights or another form of artificial light transformed indoor and outdoor spaces, such as an entire city by designing large-scale light-based architectonic units, buildings or walls. Later in the 1960s, the emergence of installation as a form of art expanded the relational studies between art and space. According to Steve Dixon, since the 1960s new technologies such as screens and digital projections have created new concepts of space (Dixon, 2007).

Indeed, artists have deployed new technologies to create three-dimensional moving spaces. Some create virtual reality spaces, such as Charlotte Davis’

Osmose (1995), which is a complex interactive virtual-reality environment installation that uses 3D computer graphics and interactive sounds to simulate mineral and vegetable nature. Others create what Dixon calls “site-specific fractures in reality”, by generating new readings of common places; such is the case of Rafael Lozano-Hemmer’s works.

Lozano-Hemmer and his team have deployed new technologies and custom made interfaces to create more than seventy works that all need to be activated by the public. The connection between people via technological machines has been a constant source of inspiration and exploration in Lozano-Hemmer’s artistic practice. With the pulse-based works the artist prioritizes the creation of group experiences rather than solitary electronic art encounters. The rhythmic and luminous nature of these interactive pieces generate spatiotemporal sensorial interactive experiences through relational ephemeral databases that can transfer our perception of the realm of the real, questioning our existence and the passing of time through illusionistic connective participations facilitated via complex systems based in digital technologies.

2 | PULSING SPACES

In his biometric body of work Lozano-Hemmer uses heartbeats and a same interface to create different scenes, transforming places by means of light. These works are based on the physical and visual interactions of participants in determinate locations. The points of viewing and perspectives in space are crucial and significant elements that determine how the audience “embodies” places and interprets the artworks (Dixon, 2007). Flashing lights that delineate

the active space create the sense of movement in the heart rate works of Lozano-Hemmer, creating emotional and connective states of conscious between individuals.

For instance, *Pulse Room* (2006) is a connective installation that works with 300 incandescent light bulbs of 300W each, all hung symmetrically with DMX cables from the ceiling of a room at a height of three meters (Figure 1). The artwork is activated when a participant touches the sensors and the computer rates his or her heartbeats. As long as the visitors grip the interface, his or her pulse first projects on one single bulb that stands out from the grid, suspended lower than the others, near the handles. Once the participants loosen their grip on the sensors, there is a blackout in the room. Subsequently a USB plug to the USB-DMX circuit that controls the bulbs translates the biometric rhythms as pulses of light in the first bulb in the grid, pushing down the line the last recordings in the bulbs of the most recent participants. The installation can be compared to a life-cycle: every time a visitor uses the interface, a new pulse rhythm is reproduced and sent to the first bulb, pushing one step forward the last heartbeats recorded, obliterating the oldest register.

Light in these works is a metaphor of life not only because it is activated by biorhythms and pulse waves, but because of its natural condition of appearance and disappearance. Also the tension and risks between seeing and not seeing, and the vulnerability of humans in non-illuminated spaces, refer us to our ephemeral and fragile existence. Lozano-Hemmer’s sources of inspiration for the biometric works were the hearing his unborn

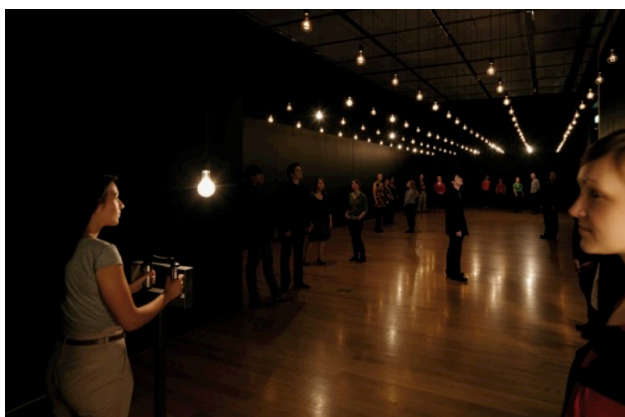


Figure 1 | Rafael Lozano-Hemmer, *Pulse Room*, 2006. Photo by Peter Mallet.



Figure 2 | Still from *Macario* (1960), directed by Roberto Gavaldón. Photography by Gabriel Figueroa.

children's heartbeats when his wife was pregnant with twins, the book *La invención de Morel* (1940) by Argentinian writer Adolfo Bioy Casares, as well as the Mexican film *Macario* (1960). Based on the novel *The Three Guests*, by German writer B. Traven and directed by Roberto Gavaldón, *Macario* narrates the story of a Mexican indigenous man that one day encounters the figure of Death, who gives him the limited ability to cure the sick. The particular scene that influenced Lozano-Hemmer depicts the protagonist who, guided by Death, has a phantasmagoric vision or hallucination in a grotto filled with millions of candles (Figure 2). Each candle represented a human life: the flickering ones were people who were alive, the unlit ones were people that had passed away, and all flames intercepted by a light wind could easily be lost. In this Mexican iconic film scene, as well as in Lozano-Hemmer's pulse-based works, there is a visualization of the collective nature of life, based in the common sharing of a same space.

Besides these metaphysical connections, the use of light bulbs in the installation can also be connected to the era of electricity and to some early experiments that created community experiences via machinery linked to our bodies. Particularly compelling and connected with Lozano Hemmer's work were the apparatus created in the middle of the 18th century by the French physicist and abbé Jean-Antoine Nollet, one of the most prolific physicists of his times. During his lifetime Nollet toured cities and towns across Europe with his apparatus inventions, using darkened salons where it was possible to observe the spectacle of sparks, electrical body attractions and reactions that kept people entertained, impressed and gleeful. In some of his soirées Nollet presented the "Leyden experiment," which consisted of a jar with water hung from the collector of an electrical mechanism by a metal clasp. By touching the inner and outside surfaces of the jar with both hands, it provoked an electrical discharge on the body. This experiment was very popular and many lecturers repeated it but it was Nollet who made of the Leyden experiment a connective and group experience by forming chains of people holding hands to experiment with a collective shock in their bodies.

Nollet and Lozano-Hemmer create community performances through different circumstances and historical contexts that reveal the mechanism of

machineries and pulsing vital forces. While science and technological experiments in electrical phenomena during the eighteenth century opened a space for the culture of performance, spectacle and education, Lozano-Hemmer's work creates a space where ultimate technology is used as an interface for the encounter of art, self and the kinetic force of collective memory.

3 | COMMUNITY SPACES AND TIME

Pulse Room (2006) was the first of a series of eight artworks that used the same interface but with different final results, reflecting a source of multiple possibilities using the same interface for altering the perception of reality in different scales. The second biometric work was *Pulse Spiral* (2008), which functions similarly to *Pulse Room* but differs in having 400 spotlights displayed according to Pierre de Fermat's Parabolic Spiral – whose equation was based in the phyllotaxis or the alternate spatial distribution of leaves on a plant stem (Figure 3). In both installations, light bulbs create a space where participants became agents and spectators of the heartbeats that lit up a dark room. But the perception of *Pulse Spiral* is more sculptural than mesmerizing: It can be appreciated from different angles, as a three dimensional object, designed to be contemplated rather than inhabited.

This can be contrasted with *Pulse Front* (2008) a colossal public art project that uses searchlights—commonly deployed either for surveillance or spectacles—to create a series of sculptures over the Toronto sky attracting not only passers-by of the specific venue but people that could see the light

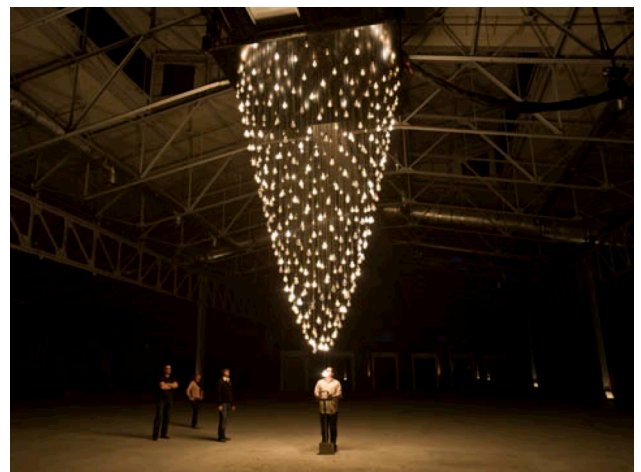


Figure 3 | Rafael Lozano-Hemmer, *Pulse Spiral*, 2008. Photo by Antimodular Research.



Figure 4 | Rafael Lozano-Hemmer, *Pulse Front*, 2008. Photo by Antimodular Research.

beams from different places kilometers away (Figure 4). It was the body that was expanded outside the realm of the human through projected lights. The result was a spectacle of dancing lights in the dark sky that communicated rays of life, phantasmagoric reflections of pulsing beings that cross along the city skyscape.

A different perspective could be found in *Pulse Park* (2008), an urban scale installation for park or stadiums that is comprised of a matrix of searchlights that also activates when someone touches a sensor that rates heartbeats, which are translated and projected as pulses of narrow-beam light that move sequentially down rows of spotlights as each consecutive participant makes contact with the sensor. The oval shape of the installation invited participants to be active agents of an interface that captures their whole attention with a sequence of lightings (Figure 5). The work is an immersive environment that covers participants' entire field of vision, capturing all their senses and increasing their emotional involvement with their own and other people's heartbeats. The body pulsations translated into different intensities of light allowed users to disconnect from the exterior physical space. The work developed new forms of relation between the passersby, ranging from playful reactions and interactions to contemplative states that



Figure 5 | Rafael Lozano-Hemmer, *Pulse Park*, Relational Architecture 14, 2008. Sketch by Antimodular Research.

invited the expansion of the senses. In Madison Square people inhabited the oval field, they interacted and played; children ran inside the space, families sat for a few minutes to observe the lights (Figure 6). The work created a connection between space and user.

French philosopher Michel de Certeau in his seminal text *L'invention du quotidien. Vol. 1, Arts de faire'* (1980) examines the realm of routine practices from a phenomenological perspective, including the ways people individualize mass culture, objects and sites, in it he argues about space:

A space exists when one takes into consideration vectors of direction, velocities,

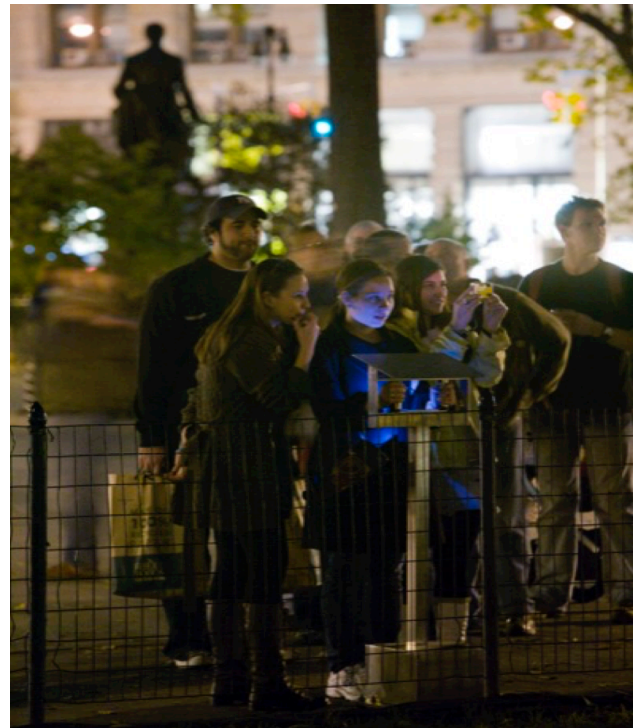


Figure 6 | Rafael Lozano-Hemmer, *Pulse Park*, Relational Architecture 14, 2008. Photo by James Ewig.

and time variables. Thus space is composed of intersections of mobile elements. It is in a sense actuated by the ensemble of movements deployed within it. Space occurs as the effect produced by the operations that orient it, situate it, temporalize it, and make it function in a polyvalent unity of conflictual programs or contractual proximities [...] In short, space is a practiced place. Thus the street geometrically defined by urban planning is transformed into a space by walkers (De Certeau, 2002, p. 117).

If we consider space as a practiced area as De Certeau suggests, public space in the connective urban-scale installations of Lozano-Hemmer acquires new meanings: it is no longer a location that express the legitimacy of a government, or a site for consumption or transit from one place to another. Thus it is transformed into a space by players, allowing improvisation and vital social interactions and relations between hundreds of citizens at a time. Hence, the works of Lozano-Hemmer appeal to a subjectivization of the body by bringing it into a community but they also generate a connective space in a state of co-presence and dialogue with other bodies, going against the objectification and individualization of the body in capitalist cultures and its massive spaces of commerce.

The pulse works transform public space (squares, parks or stadiums), usually controlled and centralized by government structures or commercial enterprises, into a space of community communication. As Jean-Luc Nancy affirms the meaning of community is “that there is no singular being without another singular being” (Nancy, 1991, p. 28). Nevertheless, being in common isn’t a homogenization; there is a consciousness about being different from one another mirrored in the different pulsation rhythms of heartbeats. Ontologically, communities are based on social structures and communication. Communication is an exposition of the inside to the outside that allows intersubjectivity (Nancy, 1991), such as the pulse-based works of Lozano-Hemmer that expose inner physical conditions to public spaces communicating possibilities of connecting and relating, while empowering participants beyond any social divisions or subordinations to any sociopolitical or economical dominion (Nancy, 1991).

But what happens with the connective installations that are not of an urban or large scale? Do they also construct multi-sensory interactions in space and generate a sense of community? In museums and galleries, where there is not as much circulation of people as there is in public spaces, the sense of community participation is also perceived but in a more intimate way. For example, in *Pulse Tank* (2008) heartbeats of individual users are translated into water waves in the ripple of a tank (Figure 7) and in *Pulse Index* (2010) participant’s fingerprints—one of the most common elements of individual identification—are projected on a LCD screen pulsing at the rhythm of participant’s heart beats (Figure 8). Because of the intimate perception of the disappearance of participants’ vital signs in the water or on the screen where the tracks of other users are also recorded, there is more of an awareness of senses and the fragility of life, of the constant sense of encounters and losses that all people experience throughout our lives. The small-scale works of Lozano-Hemmer also create a multi-sensory experience that strengthens the social bond by reminding that our life is ephemeral and is made by a sense of being-together; they evince space as a site of sharing and of a plurality of interactions.

Furthermore, the sharing of different times and tempos in the pulse-based works can be read as Bergsonian. Henri Bergson’s statement “what I call ‘my present’ has one foot in my past and another in my future” (Bergson, 1911, p.55) can be connected to Lozano-Hemmer’s works because they imply a mix of past, present and future, creating an illusion of presence and a timeless space. This generates a sense of copresence between different realities, people and times through the record of hundreds of

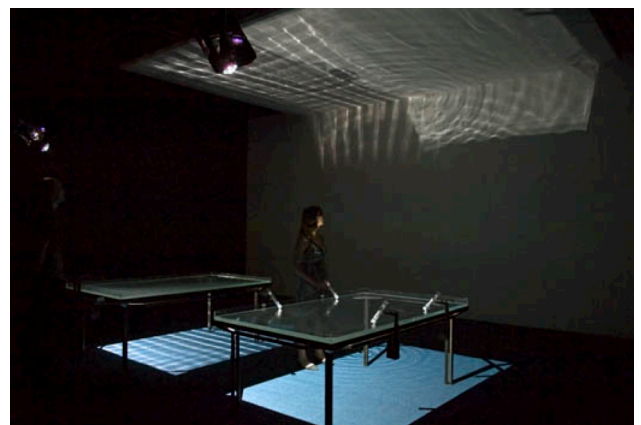


Figure 7 | Rafael Lozano-Hemmer, *Pulse Tank*, 2008. Photo by Scott Saltzman.

heartbeats that are projected as light.

In the pulse-based works of Rafael Lozano-Hemmer the idea of connecting with others, to share a space and time is core. In this sense, we can say that Lozano-Hemmer's perception of time connects to the ethical vision of philosopher Emanuel Levinas that argued that time is not a linear and non-subjective experience but rather a plural one dependent on the very relation of a subject with others; as well as a present enveloping different temporalities and tenses (Levinas, 1987). Time in Lozano-Hemmer's pulse-based works connects a subject via an interface with groups of people, creating a notion of connectivity between participants. In addition, the mixture of tenses in the works acts in a very Bergsonian way where the present is both a perception of the immediate past depicted by heartbeat recorders of previous participants, and a determination of the immediate future reflected by the obliteration of the last recorders that remind us of our imminent ephemeral permanence on earth.

Either way, the gigantic or small biometric works, the ones that use searchlights or a LCD screen, create a connective space by means of collaboration. As argued by Huhtamo, in Lozano-Hemmer's works "touching the work affects realities that are spatially distant. The responses come from human beings via the mediation of a system" (Grau, 2007, p. 87). Technology becomes instrumental for generating a space for sharing. Furthermore, digital interactivity by input feedback in the biometric installations of Lozano-Hemmer makes the audience an integral part of the artwork itself. As Söke Dinkla explains, both artists and users share the creation in interactive artworks (conceived by her as floating phenomena):

Part of the authorship transfers from the artist to the user in the floating work of art...In the cybernetic circle his own gaze, which is determined by social conventions, is thrown back at him and makes him realize that it is he who generates reality with his gaze [...] The floating work of art is no longer the expression of a single individual. Neither it is an expression of a collective, but it is the state of a "connective"—a web of influences that are continually reorganized by all participants (Dixon, 2007, p. 561).

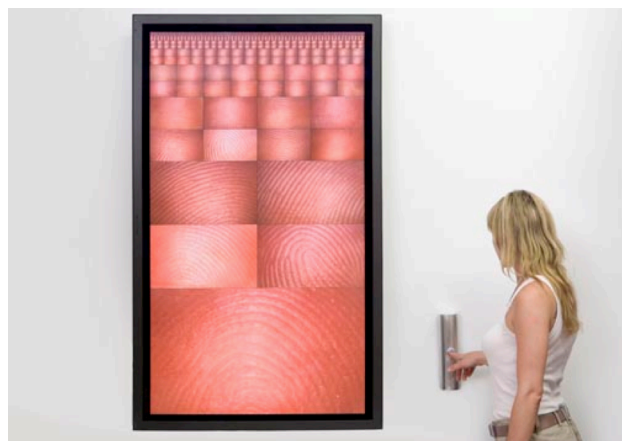


Figure 8 | Rafael Lozano-Hemmer, *Pulse Index*, 2010. Photo by Antimodular Research.

Besides this interactive condition, the aforementioned performative nature of Lozano-Hemmer's work opens an interactive cycle of what the performance theorist Erika Fischer-Lichte calls a process of *autopoiesis*. Fischer-Lichte borrows a term used by Chilean biologists Humberto Maturana and Francisco Varela to point to the unique self-producing operations of living systems—which "is a continually operating feedback loop provided in any performance event by the ongoing interactions of performers and audiences" (Fischer-Lichte, 2004, p. 6). The concept can be applied to the works of Lozano-Hemmer because they depend on participation to exist and are a feedback loop, dependent of groups of people to be activated, creating a sense of bodily co-presence of participants/performers/spectators that act and observe at the same time and space for a certain period.

The installations have their own life; they can be read as a living system or ecosystem where a community of living (people/bodies) and non-living things (technological devices) works together in a continuous feedback process. All controlled by the interactions of internal (e.g. corporeal phenomena and software) and external factors (e.g. space and participants reactions). As declared by Lozano-Hemmer, the pieces hear, listen and respond to participants' presence. Hence, there is an interactive collaboration between the installations and the participants that can create fractures in the sphere of reality by changing and challenging everyday perceptions of space and time, and by generating a space of community communication it makes spaces seem more alive. They give the particular sense to individuals of being in a specific space but also of being in a common world,

bringing into consciousness that even though individuals have diverse parallel realities they live in a community, sharing the same space with millions of people that are represented in the hundreds of heartbeats recorded with a system.

6 | CONCLUSION

It is evident that space and time in Rafael Lozano-Hemmer's biometric works are notions interconnected and determined by light. Light is a medium that serves as interface to project heartbeats in both indoor and outdoor public and private spaces, molding them, altering their meaning and perception as immersive or kinetic sites. Heartbeats besides being a corporeal element, can be read also as a unit of time, such as light that determines the difference between day and night, between the hours of sleep and wakefulness. In *Pulse Room*, *Pulse Spiral*, *Pulse Tank*, *Pulse Index*, *Pulse Park* and *Pulse Front* light-bodies change the perception of reality by recording heartbeats of participants that were memorized by a computer in different tempos. In these works, time is determined by the relation between subjects and their connection via a system that blends together light, body and memory.

Furthermore, Lozano-Hemmer's interactive and feedback-based works challenge traditional conceptualizations of space and time by creating relations between persons, bodies, areas, tempos, and realities; the works create visual bridges of communication by the transmission of collective corporal information via light beams that playfully dance in a space attracting attention, and extending and exploring compelling possibilities of connecting people via digital arts.

The pulse-based works of Lozano-Hemmer can be considered—drawing on Deleuze and Guattari's ideas—as a rhizome that via a repeating and cyclical system establishes connections between art, science, history, literature, diverse social groups, organizations or environments. The pulse works are paradigmatic examples of rhizomatic conceptions that weave a multiplicity of notions and realities, reflecting the nature of humankind and its complex constructed world.

REFERENCES

- Agacinski, Sylviane (2003). *Time Passing*. New York : Columbia University Press.
- Bertucci, Paola, "Sparks in the dark: the attraction of electricity in the eighteenth century" *Endeavour* 31 (2007) 88.
- Bergson, Henri (1911) *Matter and Memory*. London: George Allen and Unwin. [www.reasoned.org/dir/lit/matter_and_memory.pdf]. Accessed 16.06.14.
- Bioy Casares, Adolfo (1968). *La invención de Morel*. Buenos Aires: Emecé editores.
- De Certeau, Michel (1982). *The Practice of Everyday Life*. Berkeley, California: University of California Press (2002).
- Dixon, Steve. (2007). *Digital Performance: A History of New Media in Theater, Dance, Performance Art, and Installation*. London: The MIT Press.
- Foucault, Michel, "Of Other Spaces," *Diacritics* 16 (Spring 1986), 22-27.
- Fischer-Lichte, Erika (2004). *The Transformative Power of Performance: A new aesthetics*. New York: Routledge.
- Grau, Oliver (2003). *Virtual Art: From Illusion to Immersion*. Cambridge, Mass.: The MIT Press.
- Grau, Oliver (2007) *MediaArtHistories*, Cambridge, Mass./London, UK: The MIT Press.
- Huhtamo, Erkki (2008). *Strange-Common-Places: a Media Archeological Approach to Rafael Lozano-Hemmer's Art*, Author's private collection: Los Angeles.
- Huhtamo, Erkki (1994-2008) *Seven Ways of Misunderstanding Interactive Art: An Imaginary Dialogue*, Author's private collection: Los Angeles.
- Levinas, Emmanuel (1987). *Time and The Other and Additional Essays*, trans. Richard A. Cohen, Pittsburgh: Duquesne University Press.
- Lozano-Hemmer, Rafael (2000), *Alzado Vectorial: Arquitectura Relacional No. 4*, México: Conaculta.

Lozano-Hemmer (2010). *Recorders*, Manchester: Manchester Art Gallery.

Lozano-Hemmer, Rafael (2005). *Subsculptures*, Geneva: Guy Bärtschi.

Lozano-Hemmer, Rafael (2013). Interviewed by Emily Bauman, *Fnewsmagazine* [<http://fnewsmagazine.com/2009/02/taking-the-pulse-200-hearts-at-a-time>]. Accessed 03.07.14.

Nancy, Jean-Luc (1991). *The Inoperative Community*. Minneapolis: University of Minnesota Press.

Zyman, Daniela (2006) "On "Making-Room" or How Seeing Takes Place in a Light Space." In Peter Wiebel,

(ed.) *Light art from artificial art: light as a medium in 20th and 21st Century Art (467)* Ostfildern: Hatje Cantz Publishers.

BIOGRAPHICAL INFORMATION

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