

Real and Virtual Light of Relational Architecture

An Interview with Rafael Lozano-Hemmer

Light—the symbol of physics, rationalism, the spectacle, of heaven and eternity—is a funny substance to play with. It is abstract yet visible, bringing clarity while retaining its religious dimensions. Mexican Canadian Rafael Lozano-Hemmer is a media artist who chose to use light as a material and topic in his interactive installations of relational architecture, technological theater, and performance art. His best-known achievement was a project at one of the world's largest and most lively squares, the Zócalo in Mexico City. Via the Internet, participants were able to direct searchlight beams installed on the roofs of buildings around the square, thereby orchestrating and creating their own light patterns and movements. *Vectorial Elevation*, set in this grandiose urban space, took place during nothing less than the symbolic weeks of the millennium celebrations. The response of both Mexico City citizens and Internet users was overwhelming. The installation won the Austrian Ars Electronica Golden Nica award. *Vectorial Elevation* was also shortlisted for the 2000 Webby Awards.

You work with light. Can you tell us something about the relation between “light” and the artistic discipline of interactive works? My first association would be Albert Speer and Pink Floyd light shows. Who are your colleagues in this field? What are some of the latest technical developments?

It is an interesting exercise to review the history of visual art in relation to different dominant scientific perceptions of the nature of “light.” For example, Barbara Stafford's excellent book *Body Criticism* does this for the eighteenth century when she examines the impact that Newton's view of light as a stream of corpuscles had on the Enlightenment. Other art critics have done this for Romanticism making a parallel to the Young/Fresnel demonstrations of the wave nature of light, or for Modernism with Chevreul's research into chromatic composition and perception. Today, quantum physics is comfort-

able with a flexible understanding of the phenomenon of light: interpreting its behavior as both waves and particles in relation to Heisenberg's uncertainty principle, under which the instrumentation or experimental methodology used for observation is complicit with what is observed. This acknowledgement of the performative role of the observer, which Duchamp nailed with his maxim "*le regard fait le tableau*," has been the basis for most explicitly interactive art, electronic or otherwise.

An alternate operation to contextualize the visual arts with regards to "light" might be to trace technological developments rather than scientific models. Many texts have already done this, going from the magic lanterns of Della Porta and Kircher to the HIT and Lapis labs' display devices that bypass the eye in favor of direct stimulation of optic nerves, what William Gibson called *Virtual Light*. But, of course, the latest, and perhaps the final, technological development is that light is no longer fast enough, as described by Jean Baudrillard, Martin Jay, and other theorists who have noted the cultural consequences of being bound by a physical threshold with no event horizon.

The wait for light to arrive is now a major consideration in most telecommunications events as well as a major design problem for the next generations of computer processors that want to run at a faster clock rate than light can travel through their millions of transistors. It is ironic that living in a fully electromagnetic culture will mean adapting to permanent delay, to lightlag, perhaps by developing an "asynchronous body" which can process in parallel the different speeds of teleperceptive senses, as distant data packets arrive. (Technical note: It takes light 67 milliseconds to go halfway around the world, which would allow an off-the-shelf 300 MHz microprocessor to execute twenty million cycles, more or less enough for two million calculations. Our telepresent culture will always be two million calculations behind itself).

Historically, Thomas Wilfred is regarded as one of the key pioneers in the explicit use of light for creating artworks, in a new discipline which he termed "lumia." His first performance is thought to have taken place in Greenwich Village in 1922. Wilfred invented the "Clavilux," which was an organlike console that allowed real time or prerecorded control of light parameters such as intensity, color, movement, and focus, and which he used extensively in performance and exhibition settings. As early as 1929 Wilfred patented lumia projectors to be used on the top of skyscrapers; years later he created lumia "Opuses" for General Electric's and Clairol's buildings in New York City. Other lumia artists that followed Wilfred include Tom Douglas Jones (inventor of the Symphochrome in 1938), Jackie Cassen, Rudi Stern, Robert Fisher, and Christian Sidenius (who in the early sixties built a

"Theatre of Light" in Connecticut with several lumia projectors).

Albert Speer and Pink Floyd shows are definitely important precedents to a performative architectural utilization of light. In both cases, however, the main operation was one of "cathartic intimidation": The message was "This is big, you are small." Even my favorite projection artist, Krzysztof Wodiczko, used that strategy to deconstruct the master narratives of power-affirming buildings. One could argue that the contribution of personal interactivity is precisely the transformation of intimidation into "intimacy": the possibility for people to constitute new relationships with the urban landscape and therefore to reestablish a context for a building's social performance.

You speak about light in a very playful way. Is it so flexible? The way you use it is very high-tech. For me it is almost an abstract category. Very metaphysical, holy, it is the sphere of the gods. You seem to be able to use it in very different ways, to make historical and political references, as you did in your installation in Linz (Ars Electronica, 1997) and for the media and architecture festival in Graz, which was about projection, colonialism, and interaction. Both were technically and narratively complex installations. And funny too. How do you put these stories together, and what is the role of light as a virtual reality (VR) element in this?

My installation projects, done in collaboration with Will Bauer, are within a field that I call "relational architecture," which can be defined as "the technological actualization of buildings with alien memory." Here alien memory refers to something that does not belong, that is out of place, while technological actualization means the use of hyperlinks, aliasing, special effects, and telepresence.

In relational architecture, buildings are activated so that the input of the people in the street can provide narrative implications apart from those envisioned by the architects, developers, or dwellers. The pieces use sensors, networks, and audiovisual technologies to transform the buildings. In particular, light projections are used since they can achieve the desired monumental scale, and can be changed in real time, and their immateriality makes their deployment more logistically feasible.

I like to make a clear distinction between work in relational architecture and virtual reality pieces. For me, virtual architecture could be differentiated from relational architecture in that the former is based on simulation while the latter is based on dissimulation. Virtual buildings are data constructs that strive for realism, asking the participant to "suspend disbelief" and "play along" with the environment; relational buildings, on the other hand, are real buildings pretending to be something other than themselves, masquerading

as that which they might become, asking participants to “suspend faith” and probe, interact, and experiment with the false construct. Virtual architecture tends to miniaturize buildings to the participant’s scale, for example through VR peripherals such as HMDs or CAVEs, while relational architecture amplifies the participant to the building’s scale, or emphasizes the relationship between urban and personal scale. In this sense, virtual architecture tends to dematerialize the “body,” while relational architecture tends to dematerialize the “environment.” This is not to say that virtual and relational architectures are opposing practices, or that they are mutually exclusive.

Cicero, Churchill, and a dozen others have been quoted as saying “We make buildings and buildings make us.” This is far from the current urban situation; buildings no longer represent a city’s inhabitants. As Rem Koolhaas and others have noted, most new architecture consists of generic, defeated buildings that reflect market forces and not local specificity (I call these “default buildings”). A housing project in Kuala Lumpur is bound to be quite similar to one in Mexico, Cleveland, or Athens. On the other hand, we have what the Spanish architect Emilio Lopez-Galiacho calls “vampire buildings,” which are emblematic buildings that are not allowed to have a natural death, that are kept alive artificially through restoration, citation, and virtual simulation. Vampire buildings are forced to be immortal due to “architectural correctness,” a culturally, politically, and economically conservative tendency to assign a representative role to a select number of buildings. Vampire buildings, while culturally incestuous and necrophilic (or perhaps because of it), will always remain protected from erosion, gravity, war, crawling vines, graffiti, and the like.

So, one important aspect of relational architecture is to produce a performative context where default buildings may take on temporary specificity and vampire buildings may experience a declining role in their established, prevailing identification.

Having said this, I am interested in distancing my practice from the notion of the “site-specific,” particularly from the postmodern attempts to find and deconstruct essential constituent characteristics of a particular space: I am very committed to the idea that a site consists of an indeterminate number of intersecting imaginary, sociopolitical, physical, and telepresent spaces. Therefore, I like to use the term “relationship-specific” to describe the uniqueness of a discreet interaction between participants, different planes of experience, and the relational building(s). What is specific is the new behaviors that might emerge during interaction.

Yes, let’s go to the messy reality of Mexico City, in this case, where you have just fin-

ished a pearly piece of relational architecture. Do you see the high-tech equipment you have been using there clashing with rampant poverty, a low-intensity civil war in Chiapas, and in general the huge social divides in Mexico, or this is just another Western cliché?

The piece in Mexico City was commissioned by the National Council for Culture and the Arts for the millennium celebrations. The President of the Council saw my work in Austria, which questioned the notion of heritage and “cultural property,” and asked me to use Mexican history as a departure point for a spectacular installation in Zócalo Square. Now, most Mexican art this century has had a very didactic, historicist bent that is clearly evident in the *Neue Sachlichkeit* work of the muralists. Modern masters adopted a “revolutionary” aesthetic that was characterized by a problematic romanticization of indigenous peoples, a militant patriotism, and a fascination with linear models of history. Perhaps what could have been expected is to have a new kind of virtual muralism, consisting of projections of parading national heroes. The last thing I wanted to do is to repeat these monologic mantras. Fortunately, contemporary Mexican art has departed long ago from this vision, starting with Octavio Paz who challenged the concept of “progress” almost forty years ago and José Luis Cuevas who denounced muralism as a “cactus curtain” that was blocking the transit of ideas in and out of Mexico.

In any case, the problem of large-scale monologic representation is not only a Mexican phenomenon. Most millennium shows throughout the world consisted of *son et lumière* spectacles that defined a linear historicist narrative of “representative” moments or actors in history. Each of those narratives must be analyzed in terms of their exclusions of so-called minor histories, because there can never be a comprehensive, exhaustive, or neutral representation, and what is shown is always a profile of the current elite. There is a very close connection between representation and repression, particularly when it is applied to what Edward Said calls “identitarian” narratives. Elites have always used such narratives to homogenize and control what are otherwise complex, dynamic social fabrics. The millennium was the first chance to see the widespread impact of new technologies of representation on the scale and insidiousness of identitarian power affirmation (although it could be argued that they were already evident, for instance, in Pokemon consumerism or in the “special effects” capitalism of dot-com corporations).

From the very beginning of the design process I knew that the piece had to incorporate interactivity as a way of avoiding historical representation and Lurçat- and Speer-like spectacles. I wanted the main protagonist of the piece to be the participants themselves. Since the minister had asked me to look at

Mexican history to find a departure point for the piece, I investigated the largely undocumented history of Mexican technological culture. I found several useful precedents, which serve as a legitimate backdrop for electronic art projects, from the research of Gonzalez Camarena on color TV to the popularization of electronic music by Luis Pérez Esquivel. One discovery was incredibly useful: the theory of cybernetics was postulated by Norbert Wiener and Arturo Rosenbleuth at the Mexican Institute of Cardiology to explain self-regulation in the heart. Since I became aware of this, I have joked that cyberart is a native Mexican practice!

But seriously, to answer your question regarding the potential clash between high-tech equipment and the appalling economic situation of many Mexicans, I have to say that Mexico is a very complex, heterogeneous society that is full of contradictions. There is an almost feudal society in regions of Chiapas that continues to systematically impoverish indigenous people; at the same time, Subcomandante Marcos is a networked revolutionary leader who understands and uses the subversive power of "high technology." This is not to say that social inequality and technology do not clash; of course they do, for example, in the high-tech maquiladora factories in the border towns where management and technology come from the United States and the underpaid workforce, raw materials, and space come from Mexico. My position is that technology is an inevitable aspect of society, and it is a key challenge for the media artist to develop it or misuse it to break the stereotypes and create new technological languages. One of the reasons I like to quote the precedents of Mexican technological culture is precisely because I like to think that technological development is not necessarily exclusive to "developed" countries. Think of the software industry in India or the Nortec electronic music movement in Tijuana.

The piece was done in the Zócalo Plaza, which is the world's third largest square, measuring 240 by 220 meters and holding over 200,000 people. The Zócalo's monumental size makes the human scale seem insignificant, a fact that some Mexican scholars consider an emblem of a monolithic political legacy; there are almost one thousand protests a year at this site and yet its scale drowns most of them. In order to have an impact on this square it was necessary to deploy very powerful equipment: We placed eighteen robotic searchlights with a total of 126,000 watts of power on the rooftops of surrounding buildings like the National Palace, the city government headquarters, and hotels. On a clear night the searchlight beams could be seen from a 20km radius and covered the entire historic center of the city, including landmarks such as the Metropolitan Cathedral, the Supreme Court of Justice, and the Templo Mayor Aztec ruins.

Despite the power of the installation, my intention was not to do a

cathartic millennium show but a quiet, slowly fluctuating space for reflection. The concept for the piece was for people on the Internet to design light sculptures using a 3-D interface, then submit them to Mexico where they would be queued, rendered by the searchlights in the plaza, and finally documented in a digital archive. We connected the searchlights with hundreds of meters of data cable and measured their location with GPS trackers. Custom software was written to interface a VRML simulation of the Zócalo to the servers that could control the searchlights. Three Webcams placed in the National Palace, a hotel, and a skyscraper would document participants' designs and also stream live video feeds. As with any event that I have ever done in public space, the logistics were intense: We filed several reports to the Department of National Security, obtained permits from air traffic control, installed coaxial Internet feeds through the hotel's bathroom ventilation, stopped street traffic while cranes lifted the searchlights, and so on.

I have seen the video you produced that documents the Zócalo installation. It is truly amazing. What struck me in the video was the poetry of the searchlights, which are usually only set up to mimic military searchlights, scanning the night sky for suspicious objects. The movements of the ever changing grids seemed so elastic. This must be a visual trick because the hardware and software you managed to bring together looked so massive. The scale of work you are doing really has transcended the museum and gallery to large-scale urban spaces. Did you run this art project as a military operation, or rather like a business, a theater show? Does the virtual spectacle you staged resemble some elements of the big, orchestrated fireworks, pop concerts, and rave parties?

The elasticity that you are referring to is in fact the effect that I was looking for the most when designing this project. The smooth morphing between different submitted designs was crucial to evoke a sense of constant transformation and flow. The transitions between positions were as important as the positions themselves.

My original notion was for the searchlights to render a new design every second, both to fit as many participants as possible and to match the tempo of a slow heartbeat. In the end six to eight seconds were needed per design to allow the searchlights to position themselves and for the three Webcams to take pictures. In retrospect I am very glad that we used this slower pace because it invited contemplation and anything faster would have been too aggressive in a city that does not need any more aggression.

As you mention, historically searchlights have been used for military anti-aircraft surveillance and their vocabulary of movements have been limited to coordinated "sky scanning" patterns. These patterns have a very different interpretation in Europe, where bombings wiped out entire cities, than in

America, where they became associated with celebration, thanks in part to the use of searchlights in World War II victory parades. Once searchlights were adopted by Hollywood-style events, the movements became largely randomized. The searchlights were used to attract people to a single point from which the light beams originated.

In *Vectorial Elevation* the lightbeams were always in a coordinated state of mutation as they positioned themselves to render participants' designs. The movement was "purposeful" in that every six seconds a unique static pattern would emerge and then dissolve into the next one. The theatrics of power used by Speer and others was also avoided to an extent by the lack of linear narrative: The piece was in operation from dusk to dawn for two weeks, becoming more of an urban fixture than a time-based event. Although I am conscious that the scale was "spectacular," I am happier to compare the work to a public fountain or to a park bench than to a "son et lumière" show.

The piece was developed by a large number of programmers, designers, and technicians in four countries. Even though I was commissioned to design the project in March 1998, we only got to work a few months before the opening. The Internet connection in the control room was installed four days before going live! So it was a pretty tight development schedule. The physical setup was done by a Mexican company that normally presents large rock concerts and musical theater, so to them the scale was not a problem. Logistically, I have always thought that my work is more akin to the performing arts than to the visual arts. 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 theater, 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."

Can you tell us about the special software that has been developed for the Zócalo? Will there be any spin-offs, used in other installations? Will the software, for example, be available as open source? If you work at this level, what experiences do you have concerning innovative and creative further development of certain technologies? Are you optimistic about the role that such kinds of new media arts can play? Through your work within the Spanish telecom giant Telefónica, you would probably agree that "digital art is the product of transnational corporate capitalism." Could this type of work possibly influence the direction technology is taking? Or shall we, with Peter Lunenfeld, say that the Demo or Die essence of electronic arts is to perform corporate technologies?

We had twenty computers in the control room running mostly custom-made software: Linux/Apache servers, video reflectors, watermarking processors, DMX control boxes, etc. The main design specification was that the interface should be accessible across platforms, across browsers, and without the need for any plug-ins. We turned to Java as the solution but even it had to be tweaked heavily to achieve this goal. Most of the software is too specialized to be useful in other contexts, but now it will be very easy to make new versions of *Vectorial Elevation* for other cities. The only piece of software that may find itself repurposed in some form is a video streaming system that the programmers called “kxpxy” and that is released as open source. We wanted to have a cheap (free!) alternative to the current video streaming solutions from Microsoft, Apple, and Real, and that worked without plug-ins.

I agree that digital art is the product of transnational corporate capitalism. So is the environment we live in and our identity itself. Many years ago I wrote an essay for the journal *Leonardo* magazine called “Perverting Technological Correctness” where I outlined some strategies artists deploy to corrupt the inevitability of corporate technologies. Among them, I included the simulation of technology itself, the use of pain, ephemeral intervention, misuse of technology, nondigital approaches to virtuality, and resistance to what I call the “effect” effect. I believe that artists have been and can be at the forefront of technological development.

For media arts, the usual example that gets cited is the development of the data glove by Dan Sandin, Tom DeFanti, and Gary Sayers under a grant from the National Endowment for the Arts in 1977. But there are many other examples. Will Bauer, my collaborator for the past twelve years, has been developing a wireless 3-D tracking system that we have incorporated into many of our pieces. This integration has been very beneficial to both the artistic and technological developments, and we find it hard to distinguish what comes first, if anything. Of course I am aware that most technology is developed for and by the military-economic complex, but I am enamored of the romantic illusion that if art had the military’s budget we would create more jobs than they do and develop more interesting technology (including great art bombs)!

Geert Lovink is a media theorist, publisher, and radiomaker. He is an organizer of conferences, online forums, publications, and projects such as community Internet providers, mailing lists, and media laboratories. Over the last fifteen years he has lived and worked in Berlin, in Budapest, and throughout Central and Eastern Europe, teaching media theory and supporting independent media and new media culture. He is a former editor of the new media arts magazine *Mediamatic* (1989–1994) and is a member of Adilkno, the Foundation for Illegal Knowledge that has produced two books in English translation: *Cracking the Movement* (1994) and *The Media Archive* (1998). In 1995, together with Pit Schultz, he founded the international mailing list *Nettime*, whose material was brought together in the *Readme!* anthology (1999), which he coedited. He was a *Nettime* co-moderator in 1998–1999. He is now based in Sydney. His text archives are available online at <<http://thing.desk.nl/bilwet>> (through 1998) and <<http://laudanum.net/geert>>.

Rafael Lozano-Hemmer, a Mexican-Canadian electronic artist, works in relational architecture, technological theater, and performance art. His pieces have been shown in over a dozen countries and have received awards such as the Golden Nica (Austria), the Interactive Digital Media Award (Canada), an SFMOMA Webby distinction (USA), and a Cyberstar Prize (Germany). Together with his wife, Susie Ramsay, he organized the Fifth Cyberconf and initiated the "LIFE x.0" Art and a-life competition for the Telefónica Foundation in Madrid. For more information on Lozano-Hemmer, see <<http://www.lozano-hemmer.net>>; for *Vectorial Elevation*, relational architecture 4, see <<http://www.alzado.net>>; and for *Positioning Fear*, relational relational architecture 3, see <<http://xarch.tu-graz.ac.at/home/rafael/fear>>.