

## **Technological Interventions in Everyday Interaction**

Judith Donath

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The works in *Act/React* create an impression of sociability through interactivity. In our encounters with other people, we take for granted the premise that social interaction involves autonomous beings who are aware of each other. Yet when the other is a machine, the autonomy and awareness exist primarily in the mind of the human: the sociability is subjective and the transparency or opaqueness of this illusion is a central element in the machine's design. This essay concerns the nature of this form of sociability in relation to art, public space, and technology.

As human beings, we interact with one another through many modalities: gaze, touch, gesture, and speech. In our daily experience with laptops and desktops--e-mail checking, Web surfing, and game playing--touch and text are our main communication channels. When the interface grows in scale to become something approached from a distance rather than hunched over at a desk, and especially when it moves from office to gallery, the channel changes. Large interactive art installations often use vision, albeit a primitive version of that acute human sense, as their main input

modality. Vision liberates the human participant to use movement in order to interact; it is also the domain of surveillance and attention, two key themes in contemporary society. Gaze is in many ways primary--we look before we speak, and in our quotidian urban encounters with strangers, gaze is often the sole medium of communication.

Technology reshapes these everyday encounters. It allows people to be constantly connected to a vast and virtual social realm--yet paradoxically, they are often simultaneously unaware of their immediate surroundings. Today's cities teem with people tuning out the others and the environment around them; their attention lies far off, in the space of their mobile conversation with absent counterparts. The architecture of public space now faces the challenge of uniting the immediate and the virtual, potentially by becoming itself an interactive medium, connecting the inhabitants with all their surrounding spaces.

Interactive artworks encourage us to reconsider how gaze both celebrates and controls, how motion creates meaning, and why a wall might want to interact with us. They expand the boundaries of what we consider to be autonomously engendered interaction. The experimental design in today's gallery may shape tomorrow's everyday experience.

### **Interactivity and Autonomy**

Interaction weaves together two or more entities into a responsive system of action and reaction. Interactions among people range from the intense experience of a heated argument or impassioned flirtation to the nearly negligible but nevertheless essential negotiations of pedestrians passing on a narrow sidewalk. We interact with cats, dogs, horses, and other intelligent animals. Increasingly, we also interact with intelligent-seeming computational devices.

Things can be inert, reactive, or interactive. Inert things appear to be unresponsive to events happening to or around them. If I walk into a brick wall, it just stands there, the same as before (or at least seemingly the same as before--in fact, a sensitive instrument could detect and measure vibrations from the impact). Reactive things respond to the acts of another without volition: I move the control for my car's adjustable mirror, and the mirror responds without a will of its own. An interactive thing is an autonomous entity, seeking goals that are determined by instinctive or conscious desire--or that are programmed to replicate such desire.

When we speak of something being interactive, we are talking about a system in which two or more interactive entities respond to one another (I may be fully autonomous

as I yell and kick an inert wall, but its lack of response means that there is no interaction in a social sense).

This essay concerns the subjective experience of interactivity. The difference between reaction and interaction is not always apparent, hinging as it does on the question of the autonomy of the participants. A computer program is arguably only reactive, with complex rules governing its response to a number of different situations. However, its human partner may perceive it as autonomously interactive, especially if it has been designed to give this impression.

The illusion of autonomous interactivity has always been a controversial issue at the core of our relationship with computers. In the early 1960s, Joseph Weizenbaum created the ELIZA project, an interactive computer program that engaged in intelligent-seeming text conversations, playing the role of a Rogerian psychologist<sup>1</sup>. The "intelligence" was illusory: ELIZA used simple grammar parsing to reframe statements as questions. Weizenbaum created the program not to fool people, but to demonstrate that a false impression of autonomy was easy to make and thus we should not rely on a computer's seeming conversational adeptness to assess its actual intelligence. Much to his dismay, people remained enthusiastic for conversing with it even when aware of its simplistic workings. Weizenbaum found this willingness to emotionally interact with an unfeeling machine to be

chillingly anti-humanistic <sup>2</sup> (Weizenbaum 1976). Although this essay will not delve specifically into ethical questions about the nature of machine autonomy, it should be noted that they are fundamental to any discussion of technology and interactivity.

### **Magical Encounters**

While there can certainly be sinister overtones to ascribing autonomy to programmatic entities, there is also a wondrous effect in perceiving one's surroundings as richly interactive. Such fantastic environments and magical encounters occur in childhood, literature, and our conception of the past.

A child can have a lively conversation with a doll-- scolding it, soothing it, and smothering it with endearments. Although the object is inert, the child's imagination imbues it with autonomy, creating a lively, if subjective, interaction.

In literature, J. R. R. Tolkien's sentient trees, J. K. Rowling's chattering portraits, and Lewis Carroll's bloodthirsty Queen of Hearts are examples of objects that are inert in our mundane existence but come to life in fantasy worlds.

We imagine a past in which people lived amid the spirits they believed to inhabit trees, rocks, rivers, and winds. In museums, we gaze, somewhat uncomprehendingly, at the masks and amulets once worn in preparation for interactions with a pervasively animate world. Modern rational science has chased the spirits away, bringing the world tremendous progress, but also leaving it a little duller, flatter--and more inert.

Yet progress is sometimes cyclical, and technology is beginning to reanimate that dormant world. Technologies that respond to well-defined input are already so commonplace that we barely notice them--doors that automatically open at our approach, elevators that arrive with the press of a button. And there is potential for much more. Many ordinary spaces are now equipped with a complex set of sensors that detect motion and identify visitors. Today, security is the primary (and often exclusive) reason for the installation of these sensors, but in the future they may contribute to the creation of a more sociable and interactive world.

We are at the very beginning of an era of technologically enabled environmental interactivity. The presence of such interaction in architectural spaces powerfully alters their feel and function. Whereas traditional architects work with light, material, and scale, designers of public interactions add the rhythms and expectations of social

exchange, and the nature and habits of the gaze. They consider what it is that they want the audience to become aware of. What sense do they want visitors to make of their own purposes and autonomy? Do they want people's interaction to be with the space or with other people, possibly magnified or transformed? Is their gaze that of actor, participant, unblinking guard, or subordinate attendant?

### **Environmental Interactions: Precursors in Installation Art**

Environments that sense their occupants and respond to them in sophisticated ways have existed for decades, primarily as artworks in galleries and festivals. I will discuss a few prototypical examples to provide a basis for thinking about environmental interaction, focusing on several criteria that reveal how an artwork functions as an independent and social entity.

### **Physical Characteristics**

What is the shape, scale, and form of the artwork? How does it present itself to the viewer? Is it large enough to be seen by a number of people at once, or is its viewing an intimate, private experience?

Many interactive artworks involve the projection of images onto walls, floors, or objects. Free of moving parts, these installations can be quite complex and communicative, but

the experience of them can seem indirect, like looking through or at a window or mirror. Interactive sculptures can furnish a greater sense of engagement, but robotic movement and expression is less versatile than video imagery.

#### **Nature of the Space as Actual or Alternative**

Some works interact with viewers within the space they occupy, others relocate them via an avatar to an alternative space in which the action occurs. In the former case, the installation is the entity the visitor encounters, and in the latter, the installation is simply a physical viewing mechanism that leads to a virtual interaction.

#### **Nature of the Technology as Agent or Medium**

Some works are the interacting partner themselves, with the machine functioning as an autonomous being. Others serve as communicative systems, mediating interaction among participating people.

#### **The Sensing Capability of the Technology**

What does the system know about the human participants? Does it comprehend what button they pressed, where their shadow falls? Can it understand words? Assess emotion? Read minds?



There are many other criteria one could use to categorize interactive works, but these four provide a useful framework for considering our subject--social interaction in which the participant engages with (or as if with) a technological "other" that is an autonomous entity.

In the 1970s and early 1980s, Myron Krueger and his colleagues created a series of projects they termed Responsive Environments, in which they first used pressure sensors in the floor, and then computer vision systems, to sense the location and actions of viewers and thereby direct a projected display<sup>3</sup>. Krueger deftly created intuitive interactions. The pieces did not respond directly to users, but instead drew them into a parallel virtual space. In *Videoplace* (1974; fig. 1), for instance, the viewer's silhouette was projected onto a screen:

The participant is joined by a single graphic creature on the screen. The behavior of this creature is very complex and context dependent. The intent is to produce the sensation of an intelligent and witty interaction between creature and the participant. Initially, the creature sees the participant and chases his image about the screen. If the participant moves rapidly towards it, the creature, nicknamed CRITTER, moves to avoid contact. If the human holds out a hand, CRITTER will land on it and climb up the person's silhouette. As it climbs, its posture adapts to the contour of the

human form. When it finally scales the person's head, it does a triumphant jig. Once this immediate goal is reached, the creature considers the current orientation of the person's arms. If one of the hands is raised, it does a flying somersault and lands on that hand. If the hand is extended to the side but not above the horizontal, CRITTER dives off the head, roils down the arm, grabs the finger and dangles from it. When the person shakes his hand, CRITTER falls off and dives to the bottom of the screen. Each time it climbs to the top of the participant's head, it is in a different state and is prepared to take a different set of actions <sup>4</sup>.



fig. 1 Myron Krueger, *Videoplace*, 1974

*Videospace* represents the paradigm of an alternate reality existing within the ordinary world in which people effect exchanges with virtual avatars of themselves. Because the real person physically controls the movements of the

virtual embodiment, the relationship feels more like watching oneself in a mirror than interacting with another creature.

Krueger's CRITTER was designed to be mischievous, strengthening the impression of its autonomy. When machines do exactly what we request of them, we think of them only as effective machines. When they do something unasked for, they appear to have a will of their own and we ascribe intelligence to them<sup>5</sup>.

Brian Knep's Healing Series (2003-08; fig. 2) presents another interaction model, in which the environment itself responds to the viewer. Biomorphically blobs, projected onto the floor, swim about in patterns that echo the viewer's movements, much as a school of fish might follow a swimmer among them. The viewer's touch affects them directly, with no mediating avatar or shadow. This illustrates a subtle aspect of our perception of autonomy. Returning to the fish analogy, imagine you are swimming among some sea creatures and disturb their movement. If they simply shift course a bit, you have little sense of interaction; their altered direction seems like an instinctive response, scarcely more intentional than the displacement and redirection of the flow of water and the plants floating in it. However, if one of the fish looks at you, or stops to take a nibble of your arm, then there is the sensation of participating in a two-way exchange. The determining factor in an interaction

is that the participants must display both autonomy and awareness of the other.

fig. 2 Brian Knep, *Healing Series*, 2002-08

It is important to note that we are talking about the subjective perception of autonomy. Fish that simply change course may not actually be any less aware or autonomous than the individuals that come to investigate the swimmer, but they *seem* to be. The cell-like blobs in *Healing Series 1* are not actually conscious, but they *appear* to be autonomous. A slightly different interface design could swiftly eradicate this impression. For instance, if stepping on the blobs caused them to change color, the mental model <sup>6</sup> of the blob would be quite different: it would seem like a background for a paint program rather than an independent cell-like entity.

An important question is how we perceive the interacting being's goal, motivation, and character. Though Krueger's CRITTER is playful and mischievous, and Knep's blobs are primitive, interaction with them is accompanied by the unsettling specter of surveillance, of being watched and observed by a ubiquitous and not always sympathetic observer.

Interactive installations can also facilitate interaction among people, with the environment playing the role of

medium rather than participant. *Hole in Space* (1980; fig. 3), created by Kit Galloway and Sherrie Rabinowitz, was a life-size video display of crowds in two distant locations. The medium was deliberately transparent; its object was to provide the illusion of connecting people by eradicating the distance between them. Today, it is also a reminder that what seems fantastic and extraordinary can quickly become mundane--it is unlikely that a public video feed would generate nearly as much excitement today.



fig. 3 Kit Galloway and Sherrie Rabinowitz, *Hole in Space*, 1980

In Karrie Karahalios's *Telemurals* (2003; fig. 4) viewers see their own silhouettes in one color and those of distant interlocutors in other hues. Interaction occurs when the participants engage with one another in the third space of a virtual mural. They are also able to communicate verbally, though the interface corrupts their words, creating accidental poetry as it attempts to transcribe

them onto the screen. Here the medium plays a more active role, creating a common space in which disparate locations are united and transforming images and sounds.



fig. 4 Karrie Karahalios, *Telemurals*, 2003

Many interactive pieces such as those described above include screens and projections. This medium has the advantage of technical simplicity combined with great flexibility in display method and location; it can be an independent object or transform an existing surface. The disadvantage of the screen is that it is always somewhat distancing: safely flat, it cannot reach out and touch you.

Works in the round that occupy the same space as the viewer are intimately immersive. Rafael Lozano-Hemmer's *Standards and Double Standards* (2004; fig. 5) surrounds visitors with belts that appear to gaze upon them even without eyes:

Controlled by a computerized tracking system, the belts rotate automatically to follow the public, turning

their buckles slowly to face passers-by. When several people are in the room their presence affects the entire group of belts, creating chaotic patterns of interference. . . . One of the aims of this piece is to visualize complex dynamics, turning a condition of pure surveillance into an unpredictable connective system. The piece creates an "absent crowd" using a fetish of paternal authority: the belt." As in our interactions with a human crowd, a single person entering a space alone receives more focused attention than a dispersed group.<sup>7</sup>



fig. 5 Rafael Lozano-Hemmer, *Standards and Double Standards*, 2004

Marie Sester's *ACCESS* (2003; fig. 6) is also concerned with the theme of surveillance. Users direct a spotlight at an individual, and a computer vision system keeps the beam of light on the targeted subject as it moves. Everyone in the

space knows who is being "watched," but not whether the watcher is a human being or not. People react to the piece in various ways: some are made very uncomfortable by the implied surveillance while others revel in the attention.



fig. 6 Marie Sester, *ACCESS*, 2003

### **Gaze Is Interaction**

Two people who are simply looking at each other are interacting; an averted gaze signals that one is declining to interact. Numerous rules govern gaze. Strangers in public places may glance briefly at each other, but staring



is an aggressive act. We teach children to look at us when we are talking to them, to look at faces but not at bodies, and especially not to stare at sexual areas or deformities<sup>8</sup>. Not looking can also be an act of antagonism: willfully not seeing someone you know signals a public repudiation of the relationship<sup>9</sup>. The rules of the gaze shift from one culture to another. In some, it is disrespectful to look directly at an authority figure, while in others, including America, a direct gaze is considered a sign of forthrightness, and the lack of eye contact is widely considered to be an indication of dishonesty<sup>10</sup>.

The rules also shift from situation to situation. On the street, strangers are to be passed with the slightest of eye contact. At a house party, strangers are potential acquaintances, and are to be acknowledged with a returned glance and at least a passing greeting. In public spaces, a street performance can remove the social barriers in a group of strangers and transform them into an ad hoc community<sup>11</sup>; the shift is evidenced by changing gaze patterns as people look to each other to gauge and share reactions. Gaze patterns reflect people's interpretation of their situation.

Gaze is the precursor of other interactions. We look before we speak, before we touch. Observation: I am in a subway car with about twenty other passengers, and a hostile and clearly unbalanced man gets on, shouting invective.

Everyone looks away--not only away from the perceived threat, but away from each other as well. A shared glance might entangle one enough to require assisting the other, and no one wants to be responsible. If I do not see you, I can pretend not to know you are here.

One purpose of interactive works in public places is to find ways to generate communal bonds among the strangers who share a space--to make them into a group that would choose to look to one another in a crisis. Stanley Milgram's many studies of social interaction in urban spaces were initially motivated by the murder of Kitty Genovese in Queens, whose cries for help were ignored by her neighbors. He sought to understand how people related to one another in cities, and in particular, under what conditions they would transcend the self-protective habit of avoiding contact with the surrounding crowd<sup>12</sup>. Returning to the subway scenario, we can hypothesize that a group of strangers who nonetheless felt some underlying solidarity would be transformed by this event into cooperating acquaintances; that the group that was in the subway car that day did not, and instead withdrew into greater isolation, exposes the thinness of the social fabric in that city at that time. Gaze establishes these contexts. Absent, it can deepen the individuals' aloneness; present, it can initiate a social bond.

Eyes are both input and output devices <sup>13</sup>. The desire to see is the primary motivation for looking at something, while social mores constrain this gaze. One is often engaged in a private tug-of-war between what one wants to see and what one wants to signal: we may want to stare at someone we're attracted to, or whose strange appearance fascinates us, but we look away to avoid being rude.

At other times, we look away in order to see less.

Psychologists Michael Argyle and Mark Cook noted that in conversation, the speaker looked at the listener about 40% of the time, while the listener watched the speaker about 60% of the time <sup>14</sup>. Speakers tend to look away at the beginning of utterances and to face the listener at the end of their say. They hypothesized that speakers avoid the cognitive effort of face interpretation while they are engaged in composing their statements, and return to look at listeners after speaking in order to gauge their reaction, and to cue them that it is their turn to speak<sup>15</sup>

It is the dual role of input and output that makes gaze so central to interaction. What you are looking at both indicates and influences what you are thinking about. When you look at me, I believe you are aware of me.

### **Technologies of the Gaze**

The technological gaze often stares at us unblinkingly. How we interpret this gaze depends on our model of the mind and our understanding of the intention that produced it.

Anything that turns and faces you is interpretable as a gazing eye. The existence of such an eye implies an intelligence that is sensing you and seeking to learn more.

The belts of Lozano-Hemmers's *Standards and Double Standards* are really one omniscient eye that is disguised as a collective. As in many surveillance pieces, cameras in the ceiling provide video input to a central computer system that analyzes it in order to locate the people. The participants, however, do not feel as if they are under the gaze of a single, focused eye, because the gaze is distributed among the many belts. A cellular automata program provides commands such as "if my neighbor turns left, turn right." The position of a belt is thus determined not only by the people in the gallery, but by the position of neighboring belts. The result is that the belts appear to be an interacting crowd, each individual aware of its surroundings, attuned to its fellows, and attentive to intruders.

Our experience of any such gazing interaction will be influenced by the perceived social role of the observing object: if it is tall, and looking down on us, it will seem

authoritative; if small and looking up, it can seem imploring. This effect has been used for centuries in static art. Although Lozano-Hemmer's belts may symbolize parental discipline, they are not immediately threatening. They observe but do not appear to be on the brink of attack. Part of the neutrality of *Standards and Double Standards* is that the implied eyes of the buckles are waist-high, not interacting with us at eye-level. They are perhaps more interested in other belts.

*Opto-isolator* by Golan Levin with Greg Baltus addresses the question of the robotic gaze (2007; fig. 7). The piece consists of a single humanlike eye embedded in a shiny black skin and programmed to respond to the visitor's actions in seemingly meaningful ways--it blinks a second after the viewer blinks, glances away, and exhibits other naturalistic behaviors. Designed to address the questions, What if artworks could know how we were looking at them? and, Given this knowledge, how might they respond to us?, the piece senses the viewer's gaze and returns it, allowing the viewers to imagine they are looking into the window of the mechanical soul.



fig. 7 Golan Levin with Greg Baltus, *Opto-Isolator*, 2007

Marie Sester's *ACCESS* addresses the ambiguity of the mind behind the gaze in technologically generated interaction. Is it a machine or a person directing the spotlight? In fact, in this piece it can be either. The director can be a person, either stationed in the venue or remotely located anywhere with a network connection. Or the computer itself may choose the target, without any human involvement. In either case, the computer participates in the process, tracking the selected person.

What one is often seeking to learn from the gaze of others is their intentions and their assessment of their relationship to oneself, to others in the area, and to the surroundings. Attention is, on the surface, relatively easy to identify--if I look at you, I am thinking of you, and if I look elsewhere I am either not thinking of you--or trying

to convey that impression. Intention is more subtle. Am I looking at you with warmth, concern, irritation, impartial assessment, unrequited passion? This is where we seek the cues of timing, convention observed or flouted, and additional information from expression and our past experience.

A stare can be intimidating. It challenges the rules of courtesy, announcing that the person who watches need not fear the response of the watched, indeed implying that the watched must not displease the watcher. This is the gaze of surveillance, which imparts the knowledge that one is being watched by a presence that holds some power over one's behavior.

Many novels feature a marital spat in which one spouse accuses the other of gazing too much at another person at a party. The assumption is that the excessive looking resulted from illicit desire. What of a robotic eye that follows one about a gallery--is it admiring or admonishing?

Participants' reactions to Sester's *ACCESS* reflect this ambiguity. Some find the gaze disconcerting, authoritarian--they do not wish to be stared at by it or to have attention drawn to themselves. Others see it as the spotlight of celebrity and respond by performing as if on stage. The setting and occasion of the piece may influence its reception: a gallery opening or arts festival are

celebratory contexts, where people come to see and be seen; even without the spotlight, they are dressed up and performing. In a different space, in which the public expects a degree of anonymous privacy, the sudden spotlight might evoke the police search beam rather than the theater's floodlights.

Surveillance pervades our public and semi-public spaces. Security cameras watch over stores, lobbies, streets, and plazas. They are relatively covert presences, even when unconcealed. While they are meant to discourage would-be lawbreakers, they are also designed to remain unobtrusive to innocent and trusting citizens.

In the late eighteenth century, the English philosopher Jeremy Bentham designed a new type of prison, the Panopticon, which allowed a guard to observe the prisoners without being seen by them. Although the guard would watch particular prisoners only intermittently, the inmates needed to assume that they were under constant surveillance since they never knew when they were not. Surveillance cameras, as many have noted <sup>16</sup>, function in a similar way for the public at large, transforming the city into a giant panopticon in which one is never sure of being unobserved and unrecorded.

Remote Lounge was a bar in New York City, open from 2001 to 2007, where patrons could control robotic cameras to watch



each other. Large screens showed images from selected cameras; the subjects were thus on public view without knowing who was controlling the observing lens. The lounge had been designed to break down the barriers that separated people in such gathering spaces. Yet the gazing cameras--and the mind controlling them--were not always benign. As we have seen, the meaning of the gaze is encoded in time and motion--how long a gaze lasts, and exactly what it touches on. The celebrity-conferring lens has a wide range of purposes, ranging from the celebration of its subjects to their depersonalization or degradation. When I visited the Remote Lounge, cameras were frequently focused on women's breasts, embarrassing many when they saw the images onscreen. And while the individual camera operators were anonymous, the group identity shaped interpretation of the gaze. One response to the bar's closing was: "It used to be a blast there. . . . The gimmick wasn't so creepy until nobody fun showed up." The "creepiness" of Remote Lounge came from its ability to transform anyone in it, particularly women, into a sexualized pin-up--or to ridicule anyone caught in an unflattering pose.

### **Ubiquitous (Dis)Connection**

In a small village, where everyone is interdependent, people are expected to greet one another on the street. In an urban center, however, where one passes hundreds of strangers every day, no such acknowledgement is expected or indeed permitted. Passersby have no direct connection to

one another, and their bond of mutual responsibility is necessarily quite weak--one cannot be entangled with the needs of so many. At its most alienated, the city is inhabited by disconnected, anonymous beings who will feign unawareness of even the most desperate cries of need <sup>17</sup>. Yet this is not only experience of urban life. William Whyte noted the myriad ways in which people acknowledged each other in the powerful social ballets of navigating crowded streets, sharing benches, and witnessing events. His detailed observations of New York City life led him to conclude that what attracted people to particular places was primarily the presence of others <sup>18</sup>. We are drawn to and attuned to other people: the choreography of the city street works because everyone is aware of everyone else, with eye contact and gesture negotiating movement.

New technologies interrupt these interactions. Personal audio isolates individuals from the surrounding sounds and tiny screens draw their attention away from the passing faces. The mobile phone is especially disruptive. It transports the user's attention to a virtual conversation space. Phone conversations are more cognitively demanding than face-to-face ones, for while physical proximity can nurture a feeling of togetherness, on the phone the sense of connection must be maintained with a steady stream of utterances <sup>19, 20</sup>. Because attention is finite, the person on the phone navigates the street with less awareness, often missing cues in the negotiation of space and social codes.

Private calls in public spaces violate the comfort of both the speaker and the unintended--and often unwilling--listeners nearby. Attempting to create a private space, the speaker may ignore the surrounding people, avoiding eye contact to deter engagement<sup>21, 22, 23</sup>.

Thus, paradoxically, our era of increased connectivity has diminished local interaction, making for a pervasive alienation from the physical present. As we grow accustomed to--and dependent on--an accelerating flow of information, entertainment, and communication, preventing or controlling phone use in public spaces seems too restrictive. We must seek alternatives that embrace connectivity and communication, by, for instance, bringing more of the information and communication flow into public view, refocusing attention on the surrounding space and passersby.

Interactive technologies can function as social catalysts, changing the dynamics in a public space to promote interaction among strangers<sup>24</sup>. A small but growing number of artists are working in this area. For example, the Chaos Computer Club's *Blinkenlights* (2001) turned an office building into a giant screen on which viewers could control the paddles in a game of Pong with their phones and Lozano-Hemmer's large-scale interactive urban pieces *Body Movies* (2001) and *Underscan* (2005) projected images of the city's inhabitants onto the shadows cast by passersby.

Public surveillance projects, both artistic and practical, have the capacity to manifest the level of privacy one can expect in a given space. By balancing the celebratory and the surveilling gaze, they can heighten the excitement of spaces and induce the energy and creativity of performance while also alerting passersby that they are indeed on view. Imagine entering a lobby to encounter several graceful sculptures that subtly turn and face you for a moment and then return to their previous position, or pause seemingly to exchange information with other sculptures. Simply to be reacted to constitutes evidence that one is being observed.

Lozano-Hemmer is one of a number of artists who have incorporated the new sensory abilities of "the connected man," making displays that are responsive to phone calls and text messages, projecting anonymous words onto buildings, streets, and even smokestacks <sup>25</sup>. These works highlight the shifting nature of publicity in a world of burgeoning self-publishing, where attention is the most desired resource.

Some of these urban spectacles are stages for mediated artistic performance, but increasingly they are produced as commercial ventures (*LocaModa*, for example). While this phenomenon raises questions about intention--are the dialogues shaped to provoke thought or to promote

consumption?--it also indicates that such interactions will become increasingly commonplace.

What about works that incorporate the customary communicative function of technology? It is common today to see a group of people at a bar or café continually switching, sometimes awkwardly, between the immediate experience and a social situation mediated by the mobile phone. Future cafes may be furnished for trans-local interactions, welcoming remote patrons in forms ranging from large-scale video phones to tele-robotic embodiments<sup>26</sup>,<sup>27</sup>. In *Chit Chat Club* (2002-07; fig. 8), a series of physical avatars give presence and human scale to remote participants in a conversation.



fig. 8. Sociable Media Group, *Chit Chat Club*, 2002-07

## **Future Gaze**

Today, our identity is most easily sensed by other humans. We have extraordinarily sophisticated vision-based brain functions for recognizing faces<sup>28</sup> and for processing markers of social affiliation<sup>29</sup>. Such "naturalistic" sensing is currently impossible for computers. But we are evolving to adapt to their needs. We carry radio-frequency identification cards, Bluetooth devices, and other instruments that invisibly broadcast information about who we are and what we are doing, in a form that is invisible to us, but easily perceived by technological sensors.

As we synergistically make ourselves more accessible to the surrounding electronic world, our interactions with machines will be increasingly personal and familiar. The data-gaze may become deeply penetrating, seeing everything from heart rate to personal history. The key question is, what is this gaze seeking to learn? In our own interactions, we humans seek to categorize people, not only to classify them by age, gender, and race, but to know, if only fleetingly, what we can expect of others and how we should treat them. But what, it is important to ask, does the machine seek to know?

## **Notes**

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- <sup>1</sup> Joseph Weizenbaum, 'Eliza—a Computer Program for the Study of Natural Language Communication between Man and Machine'. *Communications of the ACM* 9, no. 1 (1966): 36-45.
- <sup>2</sup> Joseph Weizenbaum, *Computer Power and Human Reason* (San Francisco, CA: W.H. Freeman, 1976).
- <sup>3</sup> Myron. W. Krueger, *Artificial Reality II* (Reading, Mass: Addison-Wesley, 1991).
- <sup>4</sup> Myron. W. Krueger, *Artificial Reality II* (Reading, Mass: Addison-Wesley, 1991).
- <sup>5</sup> Judith Donath, 'Artificial Pets: Simple Behaviors Elicit Complex Attachments.' in *The Encyclopedia of Animal Behavior*, ed. Marc Bekoff (Westport, CT: Greenwood Press, 2004), 955-57.
- <sup>6</sup> Donald A. Norman, *The Design of Everyday Things* (New York, NY: Basic Books, 2002).
- <sup>7</sup> Rafael Lozano-Hemmer, Projects, <http://www.lozano-hemmer.com/eproyecto.html>. (accessed April 26, 2008).
- <sup>8</sup> Michael Argyle and Mark Cook, *Gaze and Mutual Gaze* (Cambridge, England: Cambridge University Press, 1976), p(p)?.
- <sup>9</sup> Erving Goffman, *Behavior in Public Places* (New York: Free Press, 1966)pp 114-116.
- <sup>10</sup> However, it is not a reliable signal of honesty: since gaze is fairly easy to control, liars often are careful to maintain direct eyecontact in order to appear sincere.  
Paul Ekman, *Telling Lies: Clues to Deceit in the Marketplace, Politics, and Marriage* (New York: W. W. Norton, 1992).
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