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## Appendix: Included Publications:

- Lomas, D. et al. (2008). Playpower: Radically Affordable Computer-Aided Learning with \$12 TV-Computers. Proceedings of the 2008 Meaningful Play Conference, East Lansing, MI. Oct 9 2008
- Lomas, D. (2008). Attentional Capital and the Ecology of Online Social Networks. In M. Tovey (Ed.), *Collective Intelligence*, (pp 163-172) Oakton: EIN Press
- Lomas, D. (2006). *The Transparent City*. <http://www.glowlab.com>. Retrieved December 21, 2006
- Lomas, D. (2007). Cognitive Artifacts: An Art-Science Engagement. Proceedings of the 6th ACM SIGCHI Conference on Creativity & Cognition, Washington, DC June 2008, pp. 189, New York: ACM

# Introduction

This Master of Fine Arts catalog details a selection of work from the *Social Movement Laboratory* [PLATE 2], a hybrid art/science laboratory for the study and design of human social dynamics. The laboratory was based at the *California Institute for Telecommunications and Information Technology* [PLATE 1], UC San Diego campus, from 2005-2009. The laboratory continues to exhibit projects on the Internet, at <http://www.socialmovement.org>.

In the past three years, over two-dozen projects and several peer-reviewed publications have been generated by the Social Movement Laboratory. The aesthetic focus has been on the formal structure of human social activity and the design of material interventions designed to alter those activities.

The Social Movement Laboratory has acted as a vehicle for facilitating collaborative, interdisciplinary research into the theory and practice of Social Design and Social Art.

## Definition of Social Design

*Social Design* is the design of objects and environments that catalyze and support social interactivity. A basic example is the design of a public plaza. Social Design also includes the design of interventions that alter the social structures and dynamics of an existing community. To continue the example, an interactive column might be added to the plaza to alter the flow of people [PLATE 4].

Social Design refers to the relationship between material designs and social dynamics. The work in this catalog is not only a demonstration of the social design process, but it is also posited an art practice that relates to contemporary histories of art theory and practice.

## Definition of Social Art

*Social Art* is art that addresses sociality as its primary theoretical domain for aesthetic exploration. Social Art has two aesthetic domains: representation and manipulation. For instance, the aesthetics of representations of sociality might include an aerial view of a mass demonstration [PLATE 8]. On the other hand, the aesthetics of the manipulation of sociality would consider any interventions affecting the mass demonstration, such as a giant red balloon [PLATE 8]. In the latter case, the artistic gesture is not simply the form of the object (i.e. the balloon); rather, the “substance of the art” is found within the form of the social relations in the audience, in relation to the material objects created by the artist.

As an art practice, Social Art is based upon the history of Participatory Art and the theories of Relational Aesthetics (Bourriaud, 2002) and Dialogical Aesthetics (Kester, 2004).

### *FACTORS FOR CRITICAL REVIEW*

Social Art, as presented in this catalog, seeks to connect to art history and art theory through the blended context of generative, rhetorical and aesthetic gestures. When an artistic gesture is generative, it should generate observable social change, at a large or small scale. For instance, the *Bus Stop Living Room* [PLATE 25] was primarily created to influence the social dynamics at a bus stop. When rhetorical, a work should act as evidence to articulate a theory. For instance, *Neuroethology of Myspace* [PLATE 11] seeks to demonstrate the role of empathy in social research. When aesthetic, the piece should be a sublime experience that reorients a viewer’s sense of aesthetic value. *TV Shrine* [Plate 30] is a strong example of this aesthetic intentionality. The works in this catalog typically seek to be judged upon all of these axes of art practice.

# Principles of Social Design

THE FOLLOWING 8 PRINCIPLES have proved useful in my own practice of social design.

## 1. *Media has a social effect. Design can catalyze social change:*

- The design of traditional media: propaganda posters, advertisements, instructional videos, etc are obvious examples of media that changes behavior. Music can make people dance. Clothing styles help people congregate. Art is always a conversation piece.
- The design of technology: automobiles, mobile phones, email, SMS, etc are examples of infrastructures that scaffold, coordinate, or accelerate social interactions.
- The design of architecture: planned urban spaces, public plazas, office cubicles, living rooms, etc are architectural spaces that induce particular modes of social interaction.
- The design of new interactions, rituals and social processes: planned meetings, games, classroom activities, etc are rule-based governing structures that direct social behavior.
- The design of new social ecosystems: social “scenes,” social websites, clubs, parties, open source communities, etc are examples of self-contained ecologies of social dynamics that are highly susceptible to design.

## 2. *Media effects are non-deterministic:*

Media can change people’s minds—and change society—by facilitating the introduction of new aesthetics, skills, concepts, and processes into a social ecosystem. However, as in any ecological intervention, the effects of the media can be predicted only with great imprecision. Large-scale changes, in particular, require unpredictable, emergent, bottom-up coordination of many smaller forces.

## 3. *People tend to do what they are able to do:*

Affordances for interaction can be designed. As noted by the urban theorist William Whyte, “People will sit where there are places to sit.”

## 4. *People tend to do what they see other people doing:*

People tend to unconsciously or consciously emulate the dynamics of observable social interaction. For instance, people are more likely to dance on a dance floor if other people are already dancing on it.

## 5. *People tend to do what is fun:*

If interactions are self-satisfying, people will tend to participate.

## 6. *People tend to do what brings them positive attention:*

People will work hard to do things that are important or meaningful, even if it doesn’t make them money. This is because it makes them feel important (raises their status) and because it helps them attract positive attention from others.

## 7. *Social Design is ecological design.*

Social systems are ecosystems of attentional competition. All designs (whether media, technology, architecture, or ritual) are mechanisms for the capture, coordination, and construction of attention.

## 8. *Designs can leverage existing social factors:*

Like the martial art Jujitsu, which takes advantage of the force of oncoming opponents, slight social interventions can leverage existing social factors and create significant social change. Mature systems often have specific mechanisms to govern their change; these should be identified and engaged. For instance, academic institutions have key administrators, committee reports and 5 year plans. Informal social mechanisms also tend to revolve around identifiable power structures. For instance, a popular student (or TV channel) can strongly influence fashion and behavior within social groups.

## Prescriptions for Social Design

THESE 14 PRESCRIPTIONS seek to provoke thoughtful consideration during the practice of social design; they are not imperative.

### *1. Design socially persuasive media environments:*

A shared media environment (composed of art, music, architecture, information) helps create a shared social identity. Effective social media environments capture attention, trigger empathic self-affiliation towards the media, and enable participants to co-identify with each other and with their visible, positive participation in the social situation.

### *2. Create social architectures:*

Architectural forms should correspond to the forms of the desired social interaction. Iterate and reconfigure spaces as necessary.

### *3. Build the right walls:*

Separate spaces will help cultivate autonomous social ecologies.

### *4. Lead by example:*

Use pre-arranged social interactions as models for audience emulation.

### *5. Be a good host:*

Guide social interactions by participating in the social system and attending to its needs.

### *6. Make participation personal:*

Create opportunities for participants to express identity signals and create empathic connections with one another.

### *7. Make participation obvious:*

Design clear affordances that appropriately direct individual activity.

### *8. Make participation self-satisfying:*

Design interactions that are exciting, moderately challenging and fun. Flow states are the goal. Financial compensation is too blunt as a social incentive. Food and drink, on the other hand, are classic social attractors and stimulants.

### *9. Make participation real:*

Help participants feel that they “are a part of something;” that their contributions are important to achieving a meaningful, common goal.

### *10. Make participation like a game:*

Give people structured rules to follow. Rituals, processes, and other regularities and consistencies make it easier for people to participate.

### *11. Make participation self-aware:*

Self-consciousness is often socially inhibiting, but self-reflection can also help engage bottom-up reinforcement of desirable social norms.

### *12. Create self-supporting social ecosystems:*

Help participants build social ties, share identities, and build reputations. Reinforcing networks of reciprocal attentional exchange will help coordinate and reward the attentional investment of other people. Balance the coherence and diversity in the social system in order to create a coordinating sense of forward movement towards a goal. A dynamic social system is not just “connected”; it is actively connecting.

### *13. Use your capacity for empathy:*

Empathy allows designers to understand the impact of their design. Self-identification with a participatory audience is a critical ability. The ability to mentally model and predict social activity can be cultivated through experimental *experiential* research.

### *14. Be a Jujitsu master:*

Design social interventions to leverage existing social factors.

## Social Memory Columns: A Comparative Graffiti Study

INTERNATIONAL SOCIETY OF ELECTRONIC ARTISTS (ISEA) BIENNIAL  
EXHIBITION, SAN JOSE, 2006

PUBLISHED BY ACM WORKSHOP "CREATIVITY AND COGNITION," 2007

[PLATES 2-7] The first Social Movement Laboratory project was a controlled study of graffiti production across four different neighborhoods in San Jose, California. Four 8' white columns were created and seeded with pictures of contemporary issues, identical "seed graffiti" and a dozen black sharpie markers. With no further instructions, the columns were placed in different neighborhoods for 24 hours. During this time, each column spontaneously attracted significant amounts of graffiti from local passersby. These architectural interventions disrupted the normative social conventions prohibiting graffiti and enabled synchronous and asynchronous local dialog through open participation; through this process, the columns became artifacts for collective self-awareness. *Social Memory Columns* demonstrated a replicable technique for visualizing the Freudian elements and cultural memes found within the collective consciousness of any urban locality.

At the interstices of science, art and social activism, this controlled study of graffiti production enabled the exposition of various attitudes and cultural tendencies across neighborhoods. As a sociological probe, each column reflected the *psycho geography* of the area into which it was placed. Each column explored the unpredictable collaborative aesthetics of graffiti, which was occasionally both consistent with and divergent from the typical discourse patterns that occur within bathroom stalls. Each participant engaged in a dialogue with all previous participants; each contribution to the column "crystallized" on top of the previous history of human interaction. Although the initial conditions of the columns were identical, the surfaces of each column tended to give rise to a different set of local norms and aesthetic expectations.

The San Jose City Council had provided permits for each of the columns placed throughout the city, as part of the ISEA arts festival. Despite these permits, the column that was placed in front of City Hall was taken down and demolished because it was deemed to be a threat to security. This was an unintentional gesture that nevertheless demonstrated "The War on Terror's" chilling effect on civil discourse.

As a closing gesture of urban integration, all the columns were united (including the demolished one from City Hall) for an outdoor street party for ISEA participants. The black sharpie markers that had been velcroed to each column were replaced with red permanent markers. This allowed observers to distinguish the layers of participation from the original local passersby and the self-identified "art audience."

*Social Memory Columns* helped demonstrate several "Social Design Principles" including the importance of affordances (the velcroed markers), social models (the "seed graffiti"), media effects (the identical attached pictures on each column), and the leveraging of existing social factors (the occasional participation of practicing graffiti artists had a major impact on the overall quality of each column).

With these columns, I hoped to probe the psychogeography of the city of San Jose. Like a photographic plate capturing the external forms of passersby, *Social Memory Columns* captured the internal forms present in the consciousness of the anonymous pedestrian.

PHOTO CREDITS: SHASHA LIU

...the work of art is not simply a physical object but a specific social process: the catalyzation of dialogue, the exchange of ideas, and the collective generation of new aesthetic paradigms

Grant Kester, 2004

## Crowd Studies

*IMMIGRATION RIGHTS RALLY, SAN DIEGO, 2006*

[PLATE 8] Using a video camera attached to an 8-foot diameter red weather balloon, I explored the aesthetics of social movement and crowd structures during a 100,000-person immigration rally in Balboa Park, San Diego. By attaching paper streamers to the balloon, the apparatus achieved an organic appearance (resembling an aerial jellyfish) and contributed to the ambiguity surrounding this performative gesture of self-aware mass participation/surveillance.

COLLABORATORS: SUMEET GUPTA

## RealTimeLapse + Mobile Camera Tower

*O'REILLY "EMERGING TECHNOLOGY CONFERENCE" 2007*

*MAKE MAGAZINE'S "MAKER FAIR" 2007*

*INSTITUTE FOR THE FUTURE'S "TECHNOLOGY HORIZONS" 2007*

*MARCUSE GALLERY, SAN DIEGO, 2007*

[PLATE 9] The *Mobile Camera Tower* is a 40ft aerial camera tower that is inexpensive, portable, and can be erected in less than ten minutes. Using a wide-angle camera and a recording mechanism, the *Mobile Camera Tower* was designed to help facilitate the analysis of crowd movement within public spaces, following the time-lapse methods of urban theorist William Whyte.

*RealTimeLapse* is a video-processing program (written in Max/MSP/Jitter) that creates a real-time time-lapse video. It achieves this effect by playing the last 10 minutes of recorded activity at 10X speed, up to the present moment, then looping back and playing the last 10 minutes up to the next present moment, again, ad infinitum. The "heatmaps" option would color the most active pixels red: this highlighted the most active social spaces and

produced evidence for the efficacy of a particular social space or architectural configuration.

Used in conjunction, the *Mobile Camera Tower* and *RealTimeLapse* created an opportunity for crowds of people to view their own accelerated social movements. This simple alteration of perspective and time-scale created a self-portrait of group activity and generated a collective self-awareness of the local social dynamics. Observers could track their own participation in different conversations or social circles and gain insight into the larger social structures of their own surroundings.

COLLABORATORS: ALBERT LIN, WOJCIECH KOSMA

It is the human flow of visitors, and its possible regulation, which thus becomes the raw material and the subject of the piece

Nicolas Bourriaud, 2002

## The Transparent City

*PUBLISHED BY GLOWLAB, 2006*

[PUBLICATION SECTION] *Transparent City* describes a proposed surveillance interface capable of representing the location of all mobile phones within a city. *Transparent City* considers the uncomfortably beautiful aesthetic of the visualization of city-wide social movement, as could only be revealed by comprehensive and illegal mobile phone surveillance.

"Imagine New York City during rush hour. Now, imagine that all the buildings, streets, cars and people disappear, leaving behind only small glowing orbs representing the location of tracked mobile phones.

The shimmering, organic structure of a city would quickly emerge from the collective action of these human data-points. Streets and highways reveal themselves as veins and arteries, identified through the spatially synchronous velocity of countless orbs of light. Beautiful living skyscrapers elucidate themselves through the thousands of stacked, floating orbs within them, representing the mostly sedentary activity of the modern office—some showing the subtle motions of humans walking about or traveling up and down elevators. By speeding up the rate of time, one observes these human towers rising and falling with the beginning and end of each work-day, like the fruiting bodies of the human urban super-organism.”

—from *The Transparent City* (see publications)

## BioMemetics of Myspace.com

CALIT2 HIPERWALL, SAN DIEGO, 2007

PUBLISHED BY OAKTON PRESS, 2008

[PLATE 10] *BioMemetics* was a 20-screen visualization of the exchange of social media across Myspace.com, using 100,000 profiles that had been collected from publicly available Myspace.com pages. *BioMemetics* sought to generate new aesthetic representations of online society, contribute new ideas to scientific visualization, and raise social awareness of the incredible power of mass surveillance in the era of vast warrant-less wiretaps.

Traditional network graphs tend to become illegible beyond a few hundred nodes and often fail to present how social networks evolve over time. *BioMemetics* sought to demonstrate a visualization paradigm for representing the structure and dynamics of very large social networks (>10,000 nodes). Our visualization was informed by the biological sciences, where very large cell cultures can be stained to reveal the presence of DNA codes. As such, *BioMemetics* represented Myspace.com profiles as cells in a culture that could be

"stained" to reveal the presence of a particular piece of HTML code (rich media is embedded into Myspace.com pages by the copy/pasting of strings of HTML code). By staining particular HTML strings in our "cell culture", we were able to track and visualize the growth and distribution of particular digital photos, videos, text or other phenotypic elements. Aesthetically, *BioMemetics* sought to demonstrate the organic nature of digital society by portraying it as a massive living super-organism.

*BioMemetics* was based upon a year-long ethnographic study of Myspace.com at the *Social Movement Laboratory*. Some of the conclusions from this ethnography were published in the 2008 book *Collective Intelligence*, in the paper "Attentional Capital and the Ecology of Online Social Networks" [see publication section].

COLLABORATORS: RODNEY HALL, JARED CHANDLER, WIZ KAIN, TIFFANY HOPKINS, AKSHAY PATEL, TODD MARGOLIS

## Neuroethology of Myspace.com

MARCUSE GALLERY, SAN DIEGO, 2007

[PLATE 11] *Neuroethology of Myspace.com* is also a visualization of social interaction on Myspace, albeit on an individual scale: it visualizes an individual's cognitive activity using EEG (a neuroimaging technology), superimposed over the individual's activity patterns. As an art piece, *Neuroethology* seeks to provoke questions about the capacity of the institution of science to study "real-world" cognition. Ultimately, *Neuroethology* posits the human capacity for empathy as the most important tool in the scientific study of human cognition.

*Neuroethology* refers to the neurological investigation of ecologically valid cognitive activity in situ. Because of the material constraints of brain imaging, the neurological study of cognition "in-the-wild" is extremely difficult, if not impossible. *Neuroethology* posits that Myspace.com can be viewed as an ecologically valid form of "real-world" social interaction because of its ubiquity and contemporary social importance. Social interactions on Myspace.com can, of course, be studied in the laboratory, unlike most forms of ecologically valid social activity.



Therefore, I recorded three inter-related streams of data while surfing Myspace: my on-screen activity, my facial expressions, and a 24 channel EEG. I then combined these data-streams into a single video, enabling viewers to relate EEG activity to my facial expressions and my activity on Myspace.com. This enabled a researcher/audience member to benefit from their capacity to empathize with my interactions, and use this empathy to gain insight into the nature of the EEG data.

## Identity Construction

MARCUSE GALLERY, SAN DIEGO, 2007

[PLATE 12] *Identity Construction* was a gesture to transpose the formal aesthetics of Myspace.com into a gallery setting. This effort was intended to recognize that Myspace.com may be one of the most important new aesthetics of our age. In 2007, Myspace.com had an active community of over 100 million people—this is almost certainly the largest public space in the history of mankind. The aesthetics of Myspace.com are often criticized as ugly, but the structural aesthetics of its unique information architecture is certainly responsible for the massive explosion of participatory media cultures. This piece critically engaged those aesthetic principles.

*Identity Construction* was a wall-sized area composed by an overly dense placement of art works: recent paintings, data visualizations, a video portrait, text content, and the remains of a rabbit. Without concern for the traditional white space separating works, *Identity Construction* portrayed the aggressive fecundity of online media as a subversive force within the sacred space of the art gallery. As the proliferation of online media blurs the distinction between “High Art” and “Common Art,” the democratizing power of digital art apparently devalues its production. In an age of digital media, what gives value to art, when it can be made by so readily by so many? Why should the value of a digital photo approach zero when in the

context of a gallery, it can be so privileged? It is increasingly non-provocative to suggest that the value of art is not found in the formal construction of the materials composing it, but rather in the formal construction of the viewing audience. As Pierre Huyges said, “The question is less ‘what?’ than ‘to whom?’” As such, *Identity Construction* featured a *RealTimeLapse* aerial video of the crowd structures within the gallery, as a modest representation of the formal social structures from which the value of art is derived.

## What Life Was Like Two Seconds Ago

UNIVERSITY ART GALLERY, SAN DIEGO, 2008

O'REILLY “EMERGING TECHNOLOGY CONFERENCE” 2007

MAKE MAGAZINE'S “MAKER FAIR” 2007

[PLATE 13] *What Life Was Like Two Seconds Ago* is an exploration of the role of technology as “cognitive artifacts.” In the first phase, a large-screen computer was placed on a pedestal in a conspicuous public space. The computer used a program I designed called *Echoic Memory* (coded in MAX/MSP/Jitter) to play back video with an adjustable delay. Playing back video with a two second delay was a simple tactic that engaged curious individuals, who, in stopping to examine the computer, would then see themselves appear two seconds later. This resulted in moments of self-consciousness and a feedback effect: individuals found themselves interacting with themselves, two seconds in the past and two seconds in the future. The many varied reactions to candid self-recognition were captured and turned into a set of video portraits of self-awareness at the University Art Gallery of UC San Diego.

COLLABORATORS: WOJCIECH KOSMA

## Party Dog

UCSD ADVANCED ELECTRONICS FOR THE ARTS COURSE, 2006

[Plate 14] Built in collaboration with several students in Natalie Jeremijenko's *Advanced Electronics for the Arts* course, *Party Dog*

explores the nascent practice of “Social Design” through a prototypical product that was designed with respect to social context.

We asked: could affordable breathalyzers serve to mitigate the tendency for college students to drink and drive? While some evidence suggested as much, breathalyzers, in their current form, are effectively “socially incompatible.” A breathalyzer is typically encountered either in the context of authoritarian police enforcement or alcoholics with a serious drinking problem. We did not feel that it was socially appropriate to ask friends at a party to breathalyze themselves, prior to their departure. As a result, we sought to create a product that would turn breathalyzing into a fun party activity that would also serve to deter drunk driving.

To facilitate breathalyzing in the context of typical social routines, we modified a store bought robotic dog with an added an alcohol sensor and new microprocessor. In this eye-catching form, *Party Dog* happily offered optional breath tests to departing party guests. If Blood Alcohol Levels (BAC) were low, the dog played happy music. However, when BAC levels were dangerously high, it would play scary, ominous sounding music.

*Party Dog* demonstrates the relevance of social design in consumer product design. Designers may achieve greater utility through a contextual design process that engages “social factors” in addition to the “human factors” typically considered in usability tests.

COLLABORATORS: NATALIE JEREMIENKO, ET AL

the artistic practice ... resides in the invention of relations between consciousness

Nicolas Bourriaud, 2002

## Point Light People: Party Studies

UNIVERSITY OF CALIFORNIA, CENTER FOR RESEARCH IN COMPUTERS AND THE ART (CRCA), 2008

[PLATE 15] *Point Light People* uses motion capture technology to precisely capture the informal gestural interactions taking place between groups of people; this data is then represented as point clouds within the StarCAVE (a 12-sided 3D immersive Virtual Reality environment at Calit2). The motion capture room at CRCA enabled us to simultaneously capture the gestural interactions of nine individuals as they informally socialized. The data was then “played back” as point-light clouds within the 3D stereoscopic StarCAVE. In this environment, we were able to replay the social interactions in order to identify, isolate and analyze specific social exchanges. Within this highly impoverished visual space, we were nevertheless capable of intuiting the expression of emotion and affect within the patterns of point-cloud movement. The highly constrained visual aesthetic of this project therefore highlighted the incredible human perceptual capacity for empathy.

COLLABORATORS: JURGEN SHULTZ, TODD MARGOLIS, ET AL

## YARNETWORK: Party Studies

UC SAN DIEGO, PERFORMANCE THEATER, 2006

[PLATE 16] YARNETWORK was part of an art party held in 2006 that explored the effect of “experimental social architectures” on human social interaction. The party was hosted through the conceit of a “scientific study of human social behavior within naturalistic party environments”; as such, various scientific interventions were initiated throughout the event. For instance, in addition to our social network, we invited random people to the party through posters that were designed like those requesting scientific research subjects. At the entrance, a researcher (wearing a lab coat and holding a clipboard) registered all participants, who were each required to sign a bogus human subjects form and assigned a number. They were then asked to write their number next to all of the previous registered participants who they

already knew, socially: in this way, we were able to document the social network of the guests prior to the party, and thereby empirically measure the social bonds that were formed during the event. Furthermore, an array of five aerial surveillance cameras recorded the party: the aerial perspective highlighted the various “social circles” that typically form during a party.

The YARNETWORK was a specific, performative approach to the documentation of dynamic, evolving social networks at a party. Using a large skein of yarn—and in the role of social researcher—I wrapped up individuals who were engaged in conversation with each other. This wrapping was used to illustrate the invisible bonds that were taking place between these individuals. After wrapping each group of conversing individuals, I would form a relevant link to another person in another “social circle,” based upon my knowledge of their prior social connectivity. In this manner, using yarn, I articulated the entire social network of the party. Of course, the act of wrapping up individuals and groups caused a giant entanglement, with further social repercussions (all scientific observation has an inevitable effect upon the objects of observation). This moving, dynamic, joyful, self-reflective, and organic mass of individuals was captured by the aerial cameras, and is documented in Plate 16.

The rest of the evening involved the coordination of all participants in the creation of an intervention in the UC San Diego Eucalyptus Grove. The guests engaged in the participatory assembly of brightly colored LED-based bolos, using lengths of yarn from their network. We subsequently threw these glowing bolos into the branches of the UC San Diego Eucalyptus Grove, creating an aesthetic efflorescence and new social space.

COLLABORATORS: J. TANNER CUSICK

## Sppsh-by-Number: Party Studies

UC SAN DIEGO VISUAL ARTS FACILITY, 2006

[PLATE 17-19] *Sppsh-by-Number* was an early attempt to explore a “collaborative aesthetic,” as part of the “Party Studies” series. A 12’x12’ canvas was prepared with a “paint-by-number” image, using adhesive tape and numbers. Using a veterinary syringe, 200 water balloons were filled with five colors of paint and provided to guests, who were invited to aim the balloons at the respective numbers on the canvas, from a height of 20 feet. We supposed that we would be able to remove the tape to reveal crisp lines—thus providing a guiding structure to the messy *Sppsh-By-Number* painting method. The actual results were dramatic, though impressively ugly (plate 19). Apparently, one of our fellow art students was so incensed by the aesthetic that they dragged the canvas in front of administrative offices in the middle of the night, and set the canvas on fire. I view *Sppsh-by-Number* as a failed, but nevertheless interesting experiment in a radically collaborative art practice.

COLLABORATORS: J. TANNER CUSICK

*Relational Art* is “an art that takes as its theoretical horizon the sphere of human interactions and its social context, rather than the assertion of an autonomous and private symbolic space.”

Nicolas Bourriaud, 2002

## Social Architectures Course

UC SAN DIEGO, SPRING 2007

[HTTP://WWW.SOCIALARCHITECTURES.COM](http://www.socialarchitectures.com)

[Plate 20-21] In 2006, Derek Lomas developed a project-based undergraduate course called *Social Architectures*. This course won the “Open Classroom Challenge” grant from the *University of California Institute for Research in the Arts* (UCIRA). This grant sought to support curriculum that engaged art and “action research.” Action research, developed by urban sociologist William Whyte, is a sociological research method that studies the social effects of interventions designed and implemented by the researchers. The grant was therefore used to create a fund for student to produce large-scale architectural interventions for the UC San Diego campus community.

The course *Social Architectures* was based upon two assumptions: One, it asserted that **serendipitous social interactions are an essential component of an academic institution**. This is because spontaneous academic social interactions enable the flow of knowledge, culture and ideas to transcend traditional disciplinary boundaries and fixed social routines. Two, the course was based on the idea that architecture acts as scaffolding for social interaction, and as such, the **design of an architectural space can generate or inhibit particular social dynamics**. Therefore, students in this course were asked to design architectural interventions that created observable changes in social interactions on the UC San Diego campus.

The design of architecture that facilitates social interaction is particularly relevant at UCSD, where the campus is often criticized as being “sterile” and lacking a “sense of community.” In fact, a common rumor on campus holds that the campus was specifically designed to suppress social activity, as a response to the massive anti-war student protests that occurred in campus plazas early in the university’s history. Students note, correctly, that in 1972,

graduate student George Winne Jr. self-immolated himself in Revelle Plaza; following this act, the campus declined to construct other open public plazas. While the relationship between this historical act of protest and campus planning is unclear, it is true that UCSD lacks the central plazas or grassy quads that are a typical defining element of university architecture. Instead, the architectural center of UCSD is an indoor mall connected by a walkway to the library, which is itself surrounded by an elevated plaza that rarely contains more than one or two students. These spaces and many other campus spaces often seem deliberately designed to inhibit social congregation; however, administrators emphasize that this is unintentional. These factors made the UCSD campus the perfect context for exploring the issues posed by the *Social Architectures* course.

The course itself was conceived as a relational art piece, wherein pedagogical activities were designed to effect social change and enhance “institutional empathy” towards the UCSD student body. Students self-assembled into teams, each of which applied for official permits to erect their own architectural intervention. Several high-level campus-planning administrators were invited to provide guest lectures. Through these reciprocal involvements, this course served as a dialogical space for connecting a socially active group of students with the formal procedural cultures of university campus planning.

*Social Architectures* was taught in Spring 2007 to twenty students, using a syllabus that combined art theory, media theory, cognitive science, and urban planning. Students made use of the *Mobile Camera Tower* and other tools to document the observable social change caused by their architectural interventions. The theories, observations and evidence relating to their work is available on an online wiki at [socialarchitectures.com](http://socialarchitectures.com).

STUDENTS PRODUCED THE FOLLOWING SELECTED WORKS DURING THE SOCIAL ARCHITECTURES COURSE, IN COLLABORATION WITH DEREK LOMAS:

## The Labyrinth

*SOCIAL ARCHITECTURES COURSE, UC SAN DIEGO, 2007*

[PLATE 22-23] *The Labyrinth* was a 2,200 sq ft reconfigurable translucent structure built within the eucalyptus forest in the center of UC San Diego's campus. This experimental social architecture featured living quarters, a computer lab, high-efficiency lighting, passages designed for spontaneous social engagements and a large performance space with a 12 foot waterfall that doubled as a projection screen. As there were only 8ft translucent walls and no ceilings, we used the *Mobile Camera Tower* to document the hypothesized relationship between the reconfigurable architectural structure and our emerging patterns of social activity. In this way, the Labyrinth proposed the possibility of a formal design science emerging around the relationship between architectural design and social dynamics.

Several students lived in the Labyrinth for several weeks, undisturbed by campus authorities. The material ecology of living spaces (bedding, water, electricity, chairs, desks, trash disposal, entertainment, etc) was necessarily transposed into the Labyrinth during this time, which served to illustrate the essential role of artifacts in the construction of individual and social activity. The *Hammococoon* [in Plate 22] used two eucalyptus trees and a roll of industrial cellophane to create a comfortable and durable heat-regulating sleeping enclosure.

COLLABORATORS: MARKO MANRIQUEZ, SHAWN YOURD, MARJORY LOH

## Swings: Architecting Play

*SOCIAL ARCHITECTURES COURSE, UC SAN DIEGO, 2007*

[PLATE 24] *Swings: Architecting Play* was the simple but effective installation of tree-swings in 12 locations around campus. The swings disrupted public space and created an affordance for play, as pairs of students stopped to swing. Public performances of

casual play also provoked the spontaneous social encounters that are essential for the serendipitous social connectivity that make a university's campus architecture so valuable to its central mission as an institution for knowledge production and exchange. As individual play can trigger these essential academic social engagements, the swings sought to demonstrate the relationship between informal play and pedagogy.

COLLABORATORS: JOSHUA SEGURA AND CHRISTOPHER ALLAN

## Bus Stop Living Room

*SOCIAL ARCHITECTURES COURSE, UC SAN DIEGO, 2007*

[PLATE 25] While large numbers of people typically congregate around bus stops, their proximity rarely results in spontaneous, serendipitous social interactions. Therefore, *Bus Stop Living Room* sought to alter the architectural and social implications of the common bus stop. To accomplish this, the students bought hundreds of dollars worth of goods from Target®—couches, chairs, rugs, a large shade enclosure, several tables and board games—and positioned these around a bus stop for just one single day. The students documented a far greater level of spontaneous interaction between individuals in the context of this comfortable material environment. Having collected their data, the students returned all the furniture to Target® the next day.

COLLABORATORS: CHRISTINE LIOU AND DIEGO MEJIA

These days, utopia is being lived on a subjective, everyday basis, in the real time of concrete and intentionally fragmentary experiments.

Nicolas Bourriaud, 2002

## Mobile Percussive Experiments

*SOCIAL ARCHITECTURES COURSE, UC SAN DIEGO, 2007*

[PLATE 26] Goethe once referred to architecture as “frozen music.” The reversal of this metaphor describes music as “liquid architecture”— as such, music was explored as an important architectural element within the Social Architectures course. Music is well known to be an organizing principle for social interaction. Music is common at parties, both for its relaxing effect as well as its ability to coordinate the “tone” of social interactions. Music is also a cultural structure that organizes people into self-affiliated taste communities—for instance, country music lovers rarely congregate with indie music fans. However, it is the ability for shared music to coordinate social interaction that attracted the interests of the students conducting the *Mobile Percussive Experiments*.

This project sought to document the effects of a music-based intervention on public space. The students organized several hour-long drum performances within various empty public spaces around campus. These performances would attract people, who would linger around the area for a few minutes to watch. The attraction of people would attract other people in a feedback effect. By temporally coordinating the audience, musical performances helped facilitate social interaction in unused campus spaces. This project perhaps further demonstrated that music could productively be seen as a viable element of social architectures.

COLLABORATORS: ALEXIS GABRIELSON AND JUSTIN GUTIERREZ

## George Winne Jr. Memorial

*SOCIAL ARCHITECTURES COURSE, UC SAN DIEGO, 2007*

[Plate 27] In 1972, Graduate student George Winne Jr. self-immolated himself with a can of gasoline in Revelle Plaza on the UC San Diego campus. Next to him lay a sign that read “For God’s sake, stop this war.” This was the only act of protest suicide on a

US campus during the Vietnam War. This act was seen as the inflection point that caused a movement by the UC administration to clamp down on student protest activities. By rumor, UCSD campus architecture was deliberately designed to inhibit social activity in response to this act. While unlikely to be true, the event itself marks a very different period of UCSD’s history. George Winne Jr.’s tragic act was particularly incomprehensible during the third year of the Iraq War. Students at UCSD were largely seen as politically apathetic as of 2007, and so it was hard for contemporary students to imagine massive anti-war protests in the early 1970s, let alone a protest suicide.

The story of George Winne Jr. is not common knowledge at UCSD despite (or because of) a permanent memorial that was placed in a grove of eucalyptus trees. As this memorial was placed on the opposite side of campus as the plaza where the suicide occurred, students sought to generate collective self-reflection regarding the anniversary of his death by architecturally transposing the memorial into the proper space of remembrance.

To achieve this architectural transposition, students created a long running video of the memorial and projected this onto a 20ft x 20ft cube within Revelle Plaza. Furthermore, the students created a set of colorful pamphlets that were distributed around campus, describing the original event and the reason for the candle light memorial. This was done on the occasion of the 25<sup>th</sup> anniversary of his death.

COLLABORATORS: CHRISTIN TURNER AND SASANNA YEE

## Mobile Benches: Experimental Public Seating

*SOCIAL ARCHITECTURES COURSE, UC SAN DIEGO, 2007*

[PLATE 28] *Mobile Benches* were designed almost identically to the *Memory Columns*, but for horizontal use. The *Mobile Benches* could be placed into unused public space to test whether additional public seating could facilitate “activation” of the dead space. The *Mobile Camera*

*Tower* was used to create time-lapse videos of the placement of these benches in different configurations, in order to produce evidence supporting the design of more effective public seating.

Three variants of the benches were created: One bench was seeded with graffiti and markers, like the Memory columns, and filled up in a similar way. When placed at a bus stop, the graffiti benches were used for sitting slightly less often than white benches, however they triggered more spontaneous dialog between random people. Another bench had a long metal rail attached to it, to facilitate use by skateboarders, in recognition of their valid utilization of public space. The final model (prototyped, but not completed) was a bench with a speaker embedded inside that played “social music” whenever it detected people sitting on it.

COLLABORATORS: MARJORY LOH

## Human Candyland

*SOCIAL ARCHITECTURES COURSE, UC SAN DIEGO, 2007*

UCSD lacks the typical collegiate “quad,” a central grassy space that is valued for generating spontaneous social bonds between students. Instead, the center of campus is the impressively designed Geisel Library (while the library was funded by the family of Dr. Theodore Seuss Geisel, the library is unfortunately named: ‘Geisel’ means ‘hostage’ in German). Despite the central location of the library, the closed, unwelcoming design of the plaza renders it perpetually devoid of social gatherings.

*Human Candyland* demonstrated how the invisible architectures of game interactions can structure and scaffold social interaction. The game was an intervention designed to re-invigorate and re-socialize the large, “socially sterile” concrete plaza underneath Geisel Library, which is located at the very center of UC San Diego. Through a highly visible public use of the plaza, it was hoped that this visible use might inspire others to subsequently utilize the space.

Participants were invited to a party called “Alice in Candyland,” where they were asked to dress either as a character from “Alice in Wonderland” or from the classic American board game “Candyland.” While this event received permits from the library, no alcohol could be present for the event. Therefore, pirate maps were distributed to guests, indicating various location around campus where bottles of alcohol were potentially buried. To accompany this search, the soundtrack for the “Talking Trees” (a public art piece on the UCSD campus, featuring eucalyptus trees covered in lead with internal speakers) was modified for the occasion.

For the actual game, participants assembled underneath the library, where a replica of the Candyland board game had been created at human-scale with colored chalk across the large concrete blocks of the plaza. In the original Candyland rules, the colored cards are simply shuffled at the beginning and their order pre-determines the success of all subsequent play. *Human Candyland* allowed for free-will, by enabling players to either take a card to advance to the next color, or to play their card against another player. In this case, players engaged in a modified game of “rock-paper-scissors,” where participants could play anything but “rock-paper-scissors.” Responses were judged by a panel of “Hallucinatory Arbiters,” who had to determine the winner between such battles as “Golden Robotic Monkey” vs “Delicious Melon Jungle”; “Wholly Mammoth” vs “Sparkly Fairy Dust”; or “Purple” and “My Left Shoe.” Silly, creative and provocative, *Human Candyland* was a rousing success at creating rich informal social bonds within the governing structure of the rules of the game.

COLLABORATORS: TANNER CUSICK

## Anti-Normalizer

*SOCIAL ARCHITECTURES COURSE, UC SAN DIEGO, 2007*

[PLATE 29] Can humans be considered architectural elements within a public space? William Whyte certainly thought so, as he documented the multiplicative effect of people within public plazas. In “The Social Life of

Small Urban Spaces,” Whyte observed aerial time-lapse footage of a long bench. He found that many people would pass by when the bench was empty--however, when just a single person sat on the bench, the likelihood that other passersby would stop and sit for a while was greatly increased. The idea that “social models” of interactions could alter social affordances within a space was greatly intriguing, and was pursued in the project *Anti-Normalizer*.

This project was conducted as a collaboration between the *Social Architectures* course and Brett Stalbaum's mobile phone programming course. The end result was a mobile phone game called *Anti-Normalizer* that was a scavenger hunt of anti-normal behaviors within a public space. Users formed three competing teams and wandered around campus searching for places where their location aware phone would buzz and give them an instruction. When the phone would buzz, the players would hear an instruction from the phone that related to the public space they were in. These instructions were designed to create alternative social affordances within the public space. For instance, in the center of the campus food-court (the Price Center) there is an upraised concrete pedesta that rarely receives much use--when students received an instruction in this space, they were required to stand up on the pedestal and try to convince the surrounding students of a current political event. When in the vicinity of the Tim Hawkinson's *Bear*, students were asked to climb the bear and proclaim "I am a champion" from the top. There were approximately two-dozen such situated instructions around campus, and students had to document their "anti-normal" activities with a video camera. The students were then judged based upon the activities they had documented. The overall intent of the *Anti-Normalizer* game was to direct groups of people in activities that would create new sets of social affordances within public space, exploring the role of social models as an architectural element.

COLLABORATORS: BRETT STALBAUM & STUDENTS

## TV Shrine

UC SAN DIEGO, EUCALYPTUS GROVE, 2008

[PLATE 30] The TV-Shrine was created as a response to the Eastern religious practice of embedding shrines into natural settings. The TV is such a dominant architectural form in the household, although it tends to produce an anti-social meditative state in its vicinity. As such, TV-Shrine explored how a recontextualized TV might support naturalistic spiritual practice. This was inspired by the popular Hindu “Devotional Channels” that are typical on Indian television networks, which feature a long, still image of a devotional figure, set to meditative music. A video sequence was created that displayed traditional meditation mandalas, each of which would slowly fade into contemporary, visually analogous forms, like manholes or hub-caps. This looping video was ensconced within a television that had been wrapped with cloth and bright lights and placed in the center of a typically empty eucalyptus grove (using a 150ft extension cord). A simple decorative rug and several steel bowls (filled with “offerings”) were laid out in front of the television.

TV-Shrine was an architectural intervention that sought to cultivate a quiet, reflective atmosphere that would actually suppress local social interaction. This work rhetorically articulated the point that social art need not function solely for the production of hyper-sociality, but could also explore more limited social spaces as aesthetic forms.

COLLABORATORS: KIM BESWICK

## Mobile Phone as First Computer

MUMBAI, INDIA, 2007

[HTTP://WWW.REVOLV.IN](http://www.revolv.in)

In the summer of 2007, I moved to Mumbai, India, for an internship for Qualcomm, Inc. Our directive was entitled “Mobile Phone as First Computer.” This project was motivated by the increased adoption of mobile phones by low-income consumers at the “Base of the Pyramid.” I led a team of two engineers to design and develop useful and beneficial



applications for this new and influential market. Our field research was eye-opening: wading through rice paddies to interview farmers about the economic impact of their phones or documenting atypical phone use in urban environments (for instance, we documented a vegetable seller who used his phone to attract customers—the phone was displayed on a stack of tomatoes and played looping clips of Bollywood videos!).

Our research led us to design and develop three technologies: “VIM”, an icon and voice-based interface framework that reduced the cost of language localization and made simple phone applications (like the address book) accessible to the illiterate; “Phrase Trainer,” a simple voice-based tool for learning basic phrases in any language (also accessible to the illiterate); and “Sparks,” which used a foot-powered sewing machine to charge a mobile phone, built with \$10 worth of parts from an electronics street market. This was inspired by the concept of self-reliance advocated by Gandhi and represented by the spinning wheel depicted on the flag of India. Gandhi encouraged people to spin their own cloth; with our simple, low-cost tool, they could now spin their own electricity.

COLLABORATORS: BRYANT CHOU, SHIBIN PARAMESHAWAN

How do you make a class operate like a work of art? What are the possible paths to its singularization, the source of a ‘purchase on existence’ for the children who compose it? And on the register of what I once called ‘molecular revolutions,’ the Third World conceals treasures which deserve to be explored.

Félix Guattari, 1992

## Design for Development Course

VARIOUS LOCATIONS IN INDIA & UC SAN DIEGO, SPRING 2008

[HTTP://WWW.DESIGN4DEV.COM](http://www.design4dev.com)

[PLATE 31-32] The course *Social Architectures* provided evidence demonstrating that it was possible to “catalyze social change through design” at a local, community scale. Could social design generate also social change on a much larger scale? While living in India, I became increasingly interested in the role of mobile phones and other technologies in creating positive, large-scale social change. I decided to stay in India and propose another undergraduate course that would explore how the design of technology could aid social/economic development. *Design for Development – Designing Technologies for Developing Economies* was to be a remotely taught course: the students would assemble in a classroom and connect to their instructor “in the field”. After several near misses, this course was finally approved, thanks to some visionary administrators at UCSD.

In the spring of 2008, I taught *Design for Development* from various locations in India to 18 students at UC San Diego, using Skype and other web-technologies. The students came from a range of disciplines (bioengineering, art, computer science, cognitive science, sociology, and others) and seemed primarily motivated to use their skills and knowledge to help create solutions for the problems endemic to developing countries. The majority of the students in the course had origins in developing countries—many of the students in the class spoke passionately about visiting distant family abroad, and the shock of their first experiences in China, Vietnam, India, Malaysia, etc.

Being in India, my internet connection was often unpredictable—for instance, during one class, a major fiber-optic line was cut in Egypt, resulting in a drastic reduction of our connectivity. In order to successfully lead this remote course successfully, I had to rely upon a number of pedagogical techniques that enabled the students to self-organize and enact instructionally useful social behaviors. I used a wiki to create a publication mentality, such that students were orienting the

quality of their written work towards an internet readership. I had them each create a “profile page” on the wiki, where they had to introduce themselves, their academic background, and their specific interests in “design for development.” This relatively small step enabled students to formally frame their interests and identify themselves within the functional context of this course. By articulating their passions as a matter of social representation, they co-identified themselves with the goals of the course. The other main technique was having students work on all their projects in small teams. Each class, a different team of students was assigned to act as the “student seminar leaders”; this involved giving a presentation on a topic of interest and helping to guide the class discussions. Crucially, these students were instructed to “take over” whenever my connectivity failed.

The authority of this official university course enabled me to recruit impressive guest lecturers from around the world. Nearly every class featured a different remote lecturer, who presented their own expertise in the context of “design for development” and helped answer students questions. These lecturers included a researcher from the World Bank, a Berkeley research scientist and the director of Microsoft Research, India.

The coursework for *Design for Development* was a range of collaboratively written research reports about students’ specific areas of interest in design and development. These were not restricted to overseas interventions—I emphasized that the United States is also a developing country: after all, in 50 years, our social economic development will have had to have produced more sustainable lifestyles. As such, I encouraged students to consider reciprocal technology exchanges, wherein many technologies and social practices in India could be recognized for their design implications in America.

Their mid-term report was an analysis of an existing technology that had generated social change, and their final report was a proposal

or prototype for new technology designs, which carried the intent of generating positive large-scale social change. These ranged from new agricultural products, new medicines, new educational products, green architectures and even a government-level wiki for sharing and evaluating techniques for good governance. One of the prototypes produced by the class was inspired by Bhutan’s use of “Gross National Happiness” as the primary metric of governmental efficacy. The created and tested an VoIP-based system for calling random phones in a geographic area in order to assess the factors relating to personal happiness.

Instead of serving as a traditional class lecturer, where I was the authoritative source of knowledge, I instead tried to serve the role of the student’s pedagogical “agent in the field.” I strongly emphasized the importance of developing a broad empathic understanding of the social context for which we were creating designs. To accomplish this empathic connection, I often showed students video that I had collected from a pair of sunglasses with an embedded video camera. This candid, eye-level videography enabled me to capture the “feel” of walking through a crowded market or a rural village. When UC San Diego issued a press release about the course, we ended up receiving coverage in several of India’s largest newspapers, including front-page coverage in Bombay. The journalists were just as interested in my “James Bond approach to education” (using the sunglasses video camera) as they were about non-resident Indian students in California seeking to produce solutions for India’s poor.

Dialogical works can challenge dominant representations of a given community and create a more complex understanding of, and empathy for, that community among a broader public.

Grant Kester, 2004

# The Playpower Foundation

*WINNER OF THE MACARTHUR FOUNDATION "DIGITAL MEDIA AND LEARNING" GRANT, 2009*

*THE O'REILLY EMERGING TECHNOLOGY CONFERENCE, 2009*

*MAKER FAIR, 2009*

*GAMES4CHANGE FESTIVAL, 2009*

*GAMES FOR LEARNING SOCIETY, 2009*

*PUBLISHED BY MEANINGFUL PLAY CONFERENCE, 2008*

*HTTP://WWW.PLAYPOWER.ORG*

[PLATE 33-36] The Playpower Foundation was founded in 2008 to promote the open-source production of computer-aided learning games on radically low-cost hardware. Currently, Playpower is focused on creating 8-bit learning games for "the world's most affordable home computer," a television-connected home computer that is currently for sale in street markets around the world for as little as \$10. Playpower won a \$180,000 grant from the MacArthur Foundation in April, 2009.

## THE MACARTHUR FOUNDATION APPLICATION:

### TITLE OF YOUR PROJECT

Playpower: Radically Affordable Computer-Aided Learning with \$12 TV-Computers

### BRIEFLY SUMMARIZE YOUR PROPOSED PROJECT IN ONE SENTENCE

Playpower is using a \$12 TV-computer as a platform for open-source participatory design of 8-bit learning games that will improve educational access for millions of children around the world.

### PROVIDE A ONE PARAGRAPH DESCRIPTION OF YOUR PROJECT

The Playpower Foundation (Playpower.org) is using \$12 TV-computers (TVCs) as a platform for radically affordable Computer-Aided Learning. The Playpower TVC platform is the world's least expensive home computer because it is small (contained entirely within the keyboard), uses an existing TV as a display, and is based on an 8-bit video game processor technology, which is now in the public domain (due to expired patents). Computer-Aided Learning (CAL) has been demonstrated to be a highly effective educational supplement for children attending low-quality public schools in developing countries. TVCs can also aid the development of basic computer skills, which can create real economic opportunities. In Ghana, for instance, typing skills can mean the difference between making \$1/day (as a farmer) and \$1/hour (as an office clerk). In order to maximize the educational value of the TVC, the Playpower Foundation is building an open-source Software Development Kit that will make it easy for local organizations around the world to create their own multilingual, region-specific learning games. With contributions from our partners in India, Brazil, Ghana and the USA, we have established an online community for the open-source design and development of learning games, which is currently active at Playpower.org.

### DESCRIBE YOUR PROJECT

#### *Introduction:*

Playpower is using a \$12 TV-computer (TVC) to provide radically affordable Computer-Aided Learning (CAL). The TVC is a clone of the 8-bit Nintendo® Family Computer ('Famicom'; sold in America as the Nintendo Entertainment System 1985-1995). Multiple manufacturers currently produce these clones; the maturity and scale of the manufacturing process enables a target retail price of \$12 (including full keyboard, mouse, and game controllers). All patents for this 1983 hardware have expired, meaning that this TVC is public domain. (It should be noted that 8-bit games were used successfully in American schools for over a decade; indeed, the Apple II used a 6502 processor,

like the TVC). In order to create new, multilingual learning games on the TVC, we seek funding to 1. produce an open-source Development Kit (DevKit); 2. establish a global open-source learning game development community; and 3. aid our regional partners in the design, testing, and deployment of learning games.

*Creating an Easy-to-Use Development Kit:*

Large, online communities of 'homebrew' Nintendo developers have created open-source development tools for NES games; nevertheless, content production remains difficult, as it requires assembly programming. To remove this major barrier, Playpower requests funding to aid the development of an easy-to-use, multilingual DevKit, which can catalyze the global/regional production of new software for the TVC. This DevKit will contain game creation tools that enable rapid prototyping of new games: it will also enable non-programmers to modify existing learning games simply by entering in new information.

*Creating an Open-Source Learning Game Development Community:*

Effective Computer-Aided Learning (CAL) games and a \$12 computer is a highly scalable and cost-effective solution for improving education, world-wide. However, effective CAL games are difficult to produce and are rarely profitable for commercial developers. Open-source learning games, on the other hand, enable modification, translation, reconfiguration, and content alteration: critical to the scalability and cost-effectiveness of the medium. A global open-source community for CAL can also support user-testing, pedagogical criticism, interdisciplinary CAL research, and the field-evaluation of deployed learning games: highly important for the future development of effective CAL tools.

*Facilitating Global Participation through Working Groups and Workshops:*

Playpower has established a network of local Working Groups (WG) at MIT, Stanford, CMU, UC San Diego Srishti School of Design in Bangalore, India, Sao Paulo University, in Brazil; more WGs are planned. We seek funding to support these WGs by providing them with DevKits that include TVCs (for user testing) and the hardware required to produce new TVC game cartridges. By funding public workshops in America, India, Ghana, and Brazil, Playpower will stimulate the creation of broad networks of regional developers to participate in the online community.

*Management and Collaboration via Web 2.0 Tools:*

Playpower uses free and open-source tools to support coordination between community members. Our website, blog, open-source development wiki and discussion lists are supporting cohesion between our various WGs. These tools are further designed to enable meaningful collaboration by individual participants. Tools like a version-controlled asset repository and a content management system are being developed to help us organize the large-scale participatory production of open-source code, graphics, and audio assets.

*Conclusion:*

Playpower is an open-source development community that seeks to produce effective educational games for a \$12 computer. Any level of support from the MacArthur Foundation would be of immense value to our goal of bringing radically affordable 8-bit learning games to millions of children around the world.

**DESCRIBE THE PARTICIPATORY LEARNING YOU ARE TRYING TO ACHIEVE.**

**MAX 450 WORDS.**

*Global Level: Online Participation with Playpower.org*

Playpower.org is an online community for the open-source design of learning games intended to improve educational access for millions of children around the world. Designing effective learning games is a multi-

disciplinary effort, requiring collaborations between artists, computer scientists, cognitive scientists, anthropologists, and educators. Together, our academic collaborators and our partners in developing regions are creating an open knowledge base for the design of learning games based around local needs and culture. Furthermore, Playpower.org is designed to enable students, technologists, game designers and local educators to experiment openly in the creation of new learning games for the most affordable home computer in the world.

#### *Local Level: Participatory Design and Cultural Inclusion*

A \$12 computer could enable billions more people to participate in diverse cultures of digital learning and media production. In order to stimulate the design of games relevant to regional interests, we are creating multi-lingual Development Kits (DevKits) in collaboration with our community partners in India, Ghana, and Brazil. We then hope to conduct regional workshops to engage local developers in the operation of the DevKits and to teach iterative, participatory design methods for creating effective learning games.

#### *User Level: Social Learning Games*

Playpower actively seeks to design games yielding participatory learning environments supportive of cooperation and conversation among users and observers. By designing learning games that induce social interactions, the power and complexity of an 8-bit game is dramatically enhanced by extending gameplay "off-the-screen." We aim to generate social learning experiences by engaging groups that already typically congregate around household televisions: parents, mixed-aged groups of children and friends. Social learning games can utilize a social context to support an individual's learning process in a manner that is impossible for a CAL program; additionally, social learning games can extend the educational reach of our platform beyond individual users and into the community. TV-computers offer a unique opportunity to design

these social learning games, as TVs are an existing social focal point; in contrast to PCs, laptops or mobile phones that are designed for individual use. (We note that TVs are surprisingly prevalent in developing countries, particularly in poor urban areas).

## **Discussion of Playpower**

### *CATALYZING CULTURAL DIVERSITY IN GAME DESIGN*

Central to our goals is the global participation of local developers to produce 8-bit games targeting local needs and local languages. Currently, the cultural medium of video games is dominated by American and Japanese cultures. The Playpower Foundation will hopefully catalyze the creation of more culturally diverse video games (for instance, Hindu mythology is fertile ground for the development of video game narratives and dynamics). To accomplish this, we are planning a series of workshops in multiple countries that will introduce effective design processes for creating learning games on this platform. The MacArthur Foundation is generously supporting these goals, through their Digital Media and Learning initiative.

### *MARKET JUJITSU*

Playpower is an ecological intervention in the global marketplace. What we call "Market Jujitsu" is the effort of a small group of artists to slightly deflect the direction of powerful market forces so that their products will better serve a collective social goal.

Playpower has developed relationships with several of the manufacturers of these "Education Computers." We plan to distribute the best of our new 8-bit learning games directly to these manufacturers, who are more than happy to benefit from our free R&D. As we are working to produce content in multiple languages, our contributions help these manufacturers sell products to more regions than they would before. As a result, Playpower learning games will be manufactured and eventually end up in the hands of children around the world.

The Playpower Foundation is not seeking to create a new low-cost computer—our organization is instead focused on the creation of cost-effective, high-impact, fun learning games.

*ENGAGING UNIVERSITY STUDENTS IN GLOBAL DEVELOPMENT ISSUES*

Students often long to use their skills to help make a difference in the world. Playpower seeks to create classroom curriculum that enables students to participate in the creation of learning games that could help address some of the world's most pressing problems.

*INSTITUTIONAL ORGANIZATION AS ACADEMIC PUBLISHER*

Playpower is a network. The traditional academic network facilitators were academic journals. Publications enabled the unity and discourse of a field. Playpower identifies itself primarily as a publisher, out of this traditional function of academic publications. However, it seeks to support an active research community that produces code, graphics, games, and evaluations in addition to theory.

By identifying ourselves as a publisher and offering researchers the opportunity to participate through credited academic publication, Playpower is able to integrate within the existing institutional structures of academia. We seek to reorient digital publication, by producing an online database to accompany the textual publications. Because textual media is still limited to photographic plates and the written word, we seek to create a digital reference database to accompany our publications.

*CREATING A GLOBAL CURRICULUM FOR "LEARNING GAME DESIGN"*

Playpower is working with for-profit, academic and non-profit organizations that have developed "best-in-class" design practices for the creation of computer-aided learning games. We are aggregating the best design practices into a user-centered design

curriculum that can be translated and shared with academic institutions around the world.

*CREATING A GLOBAL NETWORK OF ACADEMIC RESEARCHERS*

Engaging academic researchers around the world to participate in the research and teaching of computer-aided learning game design. Targeting the massive number of "second-tier" universities in China, India and Brazil that seek international recognition, we hope to create a framework for their global academic collaboration with top-tier universities in the United States.

*ENGAGING THE EXISTING 8-BIT ART COMMUNITY*

There is a significant subculture of artists and hackers in the USA who maintain significant interest in 8-bit computers. Many of these are musicians (known as chiptune artists), who prize the inherent constraints found in 8-bit music generation. A large number of these individuals have been volunteering for Playpower.

**8bitpeoples. NesDev**

**The minimalist aesthetics of 8-bit computing. How does creativity thrive in conditions of severe design constraints?**

*PLAYPOWER AND DIALOGICAL AESTHETICS*

Playpower is creating a dialogical medium that is connecting 8-bit culture in America and the emerging 8-bit culture in countries like India.

**Seeking to generate a dialogical connection between "geeks" and underprivileged children.**

**Playpower is a network of interaction and conversation between academics, NGOs, and commercial enterprise. Its products facilitate dialogue between its designers and its users.**

*SOCIAL DESIGN ASPECTS OF PLAYPOWER*

**Social design of global, multi-disciplinary and multi-institutional community**

The distributed development of Open Source Learning Games

Games as an intervention in the social ecology of the home.

Designing social games

Online community development of learning games

#### SOCIAL ART ASPECTS OF PLAYPOWER

Creating a venue for artists to engage in issues of global equity.  
Creating a venue for artists to reach an audience of children in developing countries.

Describe pictures in the plates.

#### HISTORY OF THE PLAYPOWER FOUNDATION

Near the end of *Design for Development* course, Lomas was exploring an electronics street market in Bangalore, India when he discovered a small shop selling 8-bit “TV-computers” for approximately US\$12. The computer was of dubious quality: it promised to help children “LERRN CIMPUTERS THE FUN-WAY”. When he plugged it into a TV and turned it on, he was impressed by the mouse-based GUI and the fact that it only took 2 clicks to access a functional BASIC programming prompt. It seemed clear that this radically affordable 8-bit computer could be a transformative technology—all it needed was some well-designed learning games.

8-bit learning games were very influential to generations of American school children growing up in the 1980s, when the Apple II computer was predominant. Games like *Lemonade Stand*, *Number Munchers*, *PAWS Teaches Typing*, and *Oregon Trail* successfully introduced generations of students to computing.

In the summer of 2008, Lomas was invited to MIT for the month-long “International Development Design Summit,” where he worked on the feasibility of Playpower with individuals from India, Ghana, Brazil, Peru, and Canada. Returning to San Diego with a global network of collaborators, Lomas teamed up with Daniel Rehn and Jeremy Douglass to form *The Playpower Foundation* with the goal of building a global open-source community for the design and development of new learning games for “the world’s most affordable home computer.”

COLLABORATORS: JEREMY DOUGLASS, DANIEL REHN, ANUJ NANAVATI, BARRETT COMISKI, PAUL BLAIR, 8BITPEOPLES, NO-CARRIER, STARPAUSE

# Theoretical Background

THE FOLLOWING SECTIONS introduce humanistic or scientific concepts that were utilized by the Social Movement Laboratory during the practice of social design.

## On Cognitive Science:

### *DISTRIBUTED COGNITION AND COGNITIVE ARTIFACTS*

Cognition is often portrayed as a set of information processing abilities that occur solely within the brain. However, studies of cognition outside the laboratory, e.g. within real human ecologies, reveal a far more variable and environmentally constructed phenomena.

*Distributed Cognition* is a theoretical framework that describes cognition as a distributed process that occurs through the interaction of the brain, the body and the environment. “Cognition in the Wild” (Hutchins, 1996) is the result of *cognitive ethnography*, wherein ethnographic methodologies were used to document and analyze the coordinated cognitive activities taking place during oceanic navigation aboard US Merchant Marine ships. The book’s depictions of cognitive phenomena *in situ* not only demonstrate that cognition occurs outside the brain, but also that it can be effectively studied outside the laboratory. Through this framework, cognition can be observed as a social activity, wherein a cognitive process can be shared across individual persons or coordinated between them. For instance, one person might perform a calculation and share the results with two other people who are negotiating the best route to port.

The Distributed Cognition framework also includes the concept of *Cognitive Artifacts*. Cognitive artifacts are any external technologies that serve to aid human cognition. For instance, writing a list on pad of paper can serve as an effective form of memory for a trip to the grocery store. “Cognition in the Wild” (Hutchins, 1996) describes how maps, rulers and written notations serve a variety of cognitive functions during a joint navigation task. When a shipman measures distance on a map, the ruler and the map can be seen as integral components of his cognitive process. Likewise, “The Design of Everyday Things” (Norman, ) provides ample evidence that the design of objects become essential components of our everyday human cognitive activities. For instance, a teapot is used as an artifact to support human social interactions, which are conceived as a form of cognitive exchange.

In our daily life we are constantly exposed to the actions of the individuals inhabiting our social world. We are not only able to describe these actions, to understand their content, and predict their consequences, but we can also attribute intentions to the agents of the same actions. We can immediately tell whether a given observed act or behavior is the result of a purposeful attitude or rather the unpredicted consequence of some accidental event, totally unrelated to the agent’s will. In other words, we are able to understand the behavior of others in terms of their mental states. I will designate this ability as *mindreading*. How do we ‘read’ intentions in the mind of other individuals? A common view maintains that all normal humans develop the capacity to represent mental states in others by means of a conceptual system, commonly designated as ‘Theory of Mind’

Gallese, 2001



### *MIND READING*

Humans have a unique capacity to read the emotional state of other people. We are remarkably adept at sharing the contents of our consciousness, whether purposefully or otherwise. When people interact, their sense of empathy enables them to rapidly and automatically interpret the emotions and meaning conveyed by other people. This is the nature of mind reading.

Mind reading is not magical. Rather, humans are simply highly sensitive to the subtle bodily or facial gestures that indicate underlying emotional states (Ekman, 1972). Particular emotions make people act in particular ways; for instance, a person feeling anger reliably “looks” different from a person feeling joy.

Humans automatically interpret the intentionality of observed human actions. We can instantaneously feel the emotional states of other people directly. In a single glance, a person may observe that another person is confident or nervous. This feeling comes from an automatic perceptual analysis of the “form” of the other person, as represented in space and time.

In monkeys, the rostral part of ventral premotor cortex (area F5) contains neurons that discharge, both when the monkey grasps or manipulates objects and when it observes the experimenter making similar actions. These neurons (mirror neurons) appear to represent a system that matches observed events to similar, internally generated actions, and in this way forms a link between the observer and the actor.

Rizzolatti, 1998

### *MIRROR NEURONS AND THE INTERPRETATION OF INTENT*

In the mid-1990s, Italian scientists (Rizzolatti, 2004) discovered neurons in the pre-motor areas of the frontal lobe of Rhesus monkeys that they called “Mirror Neurons.” These scientists were conducting studies of single neurons in the pre-motor area, in order to understand the behavior of particular neurons in response to particular stimuli. The researchers would guide a thin wire into an area of the monkey’s brain until they received a clear signal indicating the firing of a single neuron. The scientists would then explore different types of stimuli that might cause the neuron to fire vigorously.

During one such study, these scientists observed that the neuron started firing vigorously when the monkey would grasp for an apple, but would not fire strongly when the monkey used its arm in other ways. The researchers thought to test another object: as one scientist reached out to take the apple away, the researchers were surprised to hear the neuron firing, just as vigorously as before. The scientists tried a different situation, where the action of the reaching was identical, but without the apple: no firing. They had another monkey reach for the apple: vigorous firing. Together, all this research demonstrated that this “Mirror Neuron” fired during a particular intentional action (grasping), whether the monkey was doing the grasping or observing another doing the grasping. The neuron was not just responding to the visual image of the action, but rather, it seemed to respond to the intent of the action (reaching for the food).

The Mirror Neuron mechanism indicates that the brain is continually analyzing the intentionality of behind the actions it observes. Mirror Neurons have been strongly implicated in the capacity for imitation and “theory of mind.”

### *MIRROR NEURONS AND THE HUMAN IMITATION SYSTEM*

The ability to imitate, which is to copy the actions of another person, is extremely useful—it alone accounts for cultural transmission.

Chimpanzees are poor imitators and have little culture as a result. Only a few “tribes” of chimps are known to have culturally transmitted tool use, one such tribe is in the Tai Rainforests in Africa’s Ivory Coast. These chimps can use stones to break the large and difficult to crack Panda nut. Young chimpanzees begin watching their parents perform this activity at a young age, but strive for periods up to seven years to fully develop the capacity (ref). The human ability to imitate the actions of others is clearly far superior.

While chimpanzees and monkeys have mirror neurons, they clearly lack other cognitive abilities that would enable them to effectively imitate one another. Humans have incredible abilities to create mental maps of the actions of one another, and to create mental maps of the world. After all, a person’s entire conception of the world and the objects in it is largely contained in the neurological structures within their three-pound brain. Mirror Neurons are nevertheless implicated in our capacity imitate others and our capacity to understand the intentional basis of the actions of others.

#### *IMITATIVE THEORY OF EMPATHY*

As such, Mirror Neurons serve as a neurological mechanism supporting an imitative theory of empathy (ref). This theory proposes that humans derive their empathic capacities from their ability to imitate the actions of others. By perpetually and motionlessly imitating the actions of others, we can feel how we would be feeling if we were acting in the manner of the person we observe. The observation of an angry man, with brisk gestures, tense facial expressions, and loud voice, according to the imitative theory of empathy, would result in the unconscious “playback” of their specific motor activity onto a mapping of one’s own body. This “playback” would provide the feedback that allows us to feel what another person feels.

Witnessing the actions of others creates a model of their activity within a mental map of one’s own body. When we watch another

person lifting their arm and tipping their wrists to drink a cup of coffee a similar set of neurons will fire as when we would perform the same actions to drink a cup of coffee. We are modeling the actions of others in our head, in an unconscious imitation of their movements. Because of this imitative model of their activity, we can know why they act in a particular way. If they retract their hand suddenly and move their eyes in a particular way, we can infer immediately that the coffee was too hot. We are able to “put our self in another’s shoes.”

#### *CANONICAL NEURONS AND AFFORDANCES*

Rizzolatti et al (ref) also discovered a class of neurons that they termed *Canonical Neurons*. These were neurons in the pre-motor cortex of Rhesus Monkeys that fired during the grasping of an apple and also fired during the mere observation of the apple. These Canonical Neurons appeared to indicate or trigger a range of possible motor activities in response to an object; or, as a designer might say, Canonical Neurons were representing the affordances of an object. Many objects have designed affordances that suggest a specific action, such as the handle of a teapot. This concept of affordances was also described in some depth within “The Design of Everyday Things” (Norman, )

## On Media:

#### *MEDIA ARE TECHNOLOGIES FOR SHARING MEANING*

Media are physical artifacts that are used to communicate meaning. The concept of “sharing media” is often associated with digital media and online social networks, but sharing media predates the modern era. Artifacts of shared meaning can include the written or spoken word, theatrical or musical performances, bodily gestures, and even the clothes that we wear.

#### *MEDIA AS COGNITIVE ARTIFACTS*

Media are cognitive artifacts—functionally, media are technologies for the social exchange of meaning. By sharing media, humans are able to share cognitive mental states. Sharing media can also function to coordinate the activities and consciousnesses of a social group.

#### *MEDIA EFFECTS AND FORM*

Media alters cognition. These cognitive alterations, or *Media Effects*, are dependent upon the design of media; specifically, from the way individuals subjectively relate to form. For instance, a woman's smile in a magazine and the specific font of the words beneath her both derive their phenomenological conscious affect from their specific construction as forms. Emotions are embedded into the formal structure of music, art, language; or rather, emotions are embodied within the form of media. The emotional content of media is inseparable from its form; for instance, the reluctant sadness of a piece of music is inseparable from its slow tempo or slightly discordant melodic structure.

#### *EMPATHY AND MEDIA EFFECTS*

Empathy, the cognitive capacity that enables "Mind-Reading," is the same capacity that enables individuals to interpret the communicative intent of media. This is because empathy enables *the automatic, perceptual interpretation of intent within form*, whether the form is a facial expression or a painting. Thus, "Media Effects" are derived from human empathy.

#### *EMPATHY AND THE INTERPRETATION AND DESIGN OF MEDIA*

The effects of media are not universal; instead, they are cultural and contextual. Nevertheless, common cultures and contexts enable individuals to interpret media similarly. This common sensibility enables designers to use their capacity for empathy to create media that will affect others in an anticipated manner. Designers use their

capacity for empathy to guide the production of their designs by modeling a viewer's response; thus, does empathy play a central role in the design of media.

#### *EMPATHY AND MEDIA AESTHETICS*

The subjective experience of media is derived from an individual's empathic interpretation of the media: thus, subjective media experiences reflect the empathic characteristics of the viewer. When two individuals have similar experiences from a given media form, for instance, Rachmaninoff's Concerto No. 2, it is because their empathic tendencies are similar, in that particular domain. In this case, the similarities of their experiences demonstrate their shared aesthetic values. That sharing empathic tendencies towards media results in shared aesthetic interpretations demonstrates the central role that empathy plays in the shared, subjective nature of aesthetics.

#### *MEDIA TASTES, IDENTITY*

Individuals have particular aesthetic values and tastes: they are attracted to particular media forms and repelled by others. These idiosyncrasies of tastes often define us as individuals, as they have a positive feedback effect: an attraction to particular media form vastly increases one's tendency to experience it.

#### *SHARING MEDIA IS SHARING IDENTITY*

Individuals are constructed by their experiences. Sharing media experiences are a mechanism for relating to others. By sharing the consumption of cultural media, individuals share the experiences that construct themselves as individuals.

#### *MEDIA NETWORKS AND INDIVIDUAL IDENTITY*

Media is the extension of the self: our identity is composed not only by our DNA or cognitive habitus, but also by the clothes we wear, the films we watch, or the music we play in our homes. Individual identity is a media performance: mannerisms, topics of speech, clothing,

automobiles, living spaces, etc. Actor-Network theory [reference](#) defines the self in terms of its social and material networks of access and utility.

#### *RECOMBINANT MEDIA*

When a person strongly self-identifies with a media form, they often use it to construct their own identity. In this manner, media is recombinant, as individuals construct their self from their previous media interactions. [Describe Myspace Page](#)

#### *MEDIA TASTES AND SOCIAL COORDINATION*

An individual's taste for media has a significant influence on their subsequent experiences and social positioning. A person's taste in media often draws them into closer proximity to other individuals who share their taste. In this manner, media-tastes are a force for the emergent organization of society into sub-cultures. The people who like attending Jazz bars, Death-Metal concerts, gallery openings, or sporting events will form new social relationships through these media experiences, strengthening their relationship to the media and its affiliates. In this way, media can coordinate social bonds.

Shared aesthetics are important for developing a sense of trust within social relationships. When an individual discovers that another person shares their attraction to or disgust with a particular piece of media, their common interpretation can serve as a powerful bond. When two individuals share aesthetic values, it reflects their similar empathic capacities.

#### *SOCIAL NETWORKS ARE INFORMATION NETWORKS*

Whether through casual conversation in a cocktail party, emails to friends, or postings on social media sites, social networks are structural elements that govern the distribution of information and media through society. Within evolving networks of social

interaction, media acts as a social reference point, helping individuals relate to one another.

#### *MEDIA KNOWLEDGE*

Human knowledge and meaning is shared through media. Scientific publications and newspapers are media forms for the coordination of the human comprehension of the world. All of art history exists as representations of media artifacts.

#### *MEDIA IS AN EXTENSION OF THE HUMAN CONSCIOUSNESS*

Marshall MacLuhan (1968) described technology as an extension of the body: media is the extension of the human consciousness. Media enables consciousness to be shared between people: When an artist creates a picture or a song, their character and consciousness is partially embodied within the work. When a person writes a love letter, their intentionality and feelings are embodied as words on paper that can be moved through time and space. When a person speaks passionately, other people can feel the way they feel. This act of media creation enables the sharing of conscious feelings through an empathic engagement with observers.

#### *CONSCIOUSNESS SHARED THROUGH MEDIA*

Consciousness and intentionality can be embedded into material forms like speech, gesture, writing, images, architecture, etc. The formal structure of physical artifacts is capable of conveying conscious feeling.

#### *SHARED ATTENTION AS THE SYNCHRONIZATION OF CONSCIOUSNESS*

When two individuals coordinate their attention, such as during a conversation, they are synchronizing the contents of their consciousness. Attention itself is a synchronization of cognitive resources, the act of which brings the objects of one's attention into conscious awareness.

#### *DISTRIBUTION OF CONSCIOUSNESS THROUGH MEDIA*

Human consciousness extends, reproduces, and distributes itself through media. For instance, an artist can compose a film that expresses the contents and emotional character of her consciousness. When the audience watches the film, their conscious experiences replicate the conscious state of the artist. Artists and authors can develop powerful abilities to create media that will reliably generate specific feelings in their audiences. Excitement, longing or tragedy are conscious feelings that can be embedded into a film, for instance, and reliably conveyed to audiences. This phenomena is not restricted to media like films. On a day-to-day basis, humans communicate their conscious states through media. For instance, a student may Twitter her reaction to a date, post a picture on her Facebook profile, or more directly, simply talk to their friends.

#### *MEMETICS*

*Memes* are a concept originally introduced by biologist Richard Dawkins (1976), as the cultural counterpart to genes. Particular concepts, skills, rituals etc can be copied and recombined throughout human society in a manner that is similar to the dynamics of genetic propagation. *Memetics* is a proposed field of study for the dynamics of these units of human culture. The evolutionary or adaptive success of a human cultural group is therein described in terms of its memetic material. The concept of memetics achieved popular recognition because of its use in describing the uncanny distribution patterns of viral media on the internet.

#### *MIMETIC MEDIA*

Symbolic representation is a communicative process of arbitrarily mapping concepts onto token forms (symbols). For instance, we write “cup” as a shared linguistic symbol that is useful for communication, but bears no resemblance to the object being

represented. *Mimetic* representation is a communicative process of mapping concepts onto forms that share salient features. For instance, a young child may bring their hands together and imitate drinking, in order to draw the attention of a caregiver to a cup that is out of reach. Gestural communication is rich in mimetic forms and even spoken language has onomonapoeia—photography and videography are high fidelity mimetic communication forms. Even music is believed to be mimetic, through its direct mapping of the time scales and harmonies/dissonances of the neurological firing patterns associated with particular emotional states.

## On Games:

#### *GAMES AS MEDIA*

Games are a media form. Games are defined by their rule-based interactivity, which demonstrate that rule-based interactivity is a media form. Everything from religious rituals to culturally specific social conventions are rule-based interactive media forms.

#### *SOCIAL IMPACT OF GAMES*

Games can have a powerful social impact, because they are rule-based modes of social interaction. Rituals are the same way. They guide participation in a highly directed manner and often structure reciprocal exchanges of attention.

#### *GAMES IN SOCIETY*

There are many unspoken and explicit rules for interaction in different human societies. Sociality is often like a game; games seem to have evolved from the cognitive abilities required for social interaction. Team games help people practice coordinating cognition as a single unit. This is good practice for other types of social behavior in society, like hunting mammoths or working for a company.

### *SOCIAL GAMES*

Nearly all games tend to facilitate or foster social interactivity. One reason for this is the manner in which games impose an outside structure that governs social interchanges, as with many card games, like Bridge. Many sporting games create a spectacle of shared attention that causes empathic self-identification with a competitor or team, as with American Football; this facilitates conversation and coordination between individuals that share that self-identification. Even video games, which are often thought of as “anti-social,” have been demonstrated to be a major organizing principle in contemporary social life (Reference MacArthur Study). Video game play creates a social event where participants share attention, strategy, and empathy.

### *ANTI-SOCIAL GAMES*

Not all gameplay is pro-social, however: some games are notable for their ability to sow mistrust, ill-will and fighting; “Monopoly” (Parker Brothers) is famous for this, though “Sissy Fight 2000” (Eric Zimmerman, et al) is a more modern and striking example.

### *THE NEW GAMES MOVEMENT*

In the mid-1970s, Stewart Brand co-founded “The New Games Movement,” which promoted non-zero-sum games like “The Human Knot,” “Face Pass,” and “The Lap Game” to summer camps around the country. These “pointless” games are played just for the fun of it—scores are not kept nor winners determined. Traditionally used as social “ice-breakers,” these games are powerfully effective devices for generating formative social bonds among newly introduced groups of people.

The mechanism for this bonding effect may stem from several factors: 1. The games tend to involve human touch. 2. They always involve some form of reciprocal exchange. 3. They require total participation to “function.” 4. There are no losing individuals or

teams. 5. There is lots of room for interstitial social communication within the conduct of the game, i.e. people can talk a lot while they play.

## On Architecture

### *ARCHITECTURE AS MEDIA*

Architecture is media; media is architecture. Architectural space is a media space; it is composed of media elements. Every form, color, material, and pattern in an architectural whole has an emotionally affective implication. A building has a media effect whether we are looking at it as we walk down the street or whether we are living in it.

### *ARCHITECTURE AS COGNITIVE ARTIFACT*

Architecture is a scaffold for social interaction. Architectural space enables the coordination of attention, whether through the shared reverence of a cathedral or the applied functionality of a large table and plentiful chairs within a boardroom. Architectural alterations will alter the interactions of the people within it. For an obvious case, consider the social implications of a boardroom with only half as many chairs as people. Architectural forms can, non-deterministically, facilitate or inhibit particular types of social interaction.

### *ARCHITECTURE AS NETWORK INFRASTRUCTURE*

Public space is a vital element in an information economy. This can be seen within the context of an academic institution, where the classic courtyards and quadrants are used to facilitate spontaneous social interaction. These informal social interactions generate valuable links between people and disciplines. Similarly, could the civics of ancient Rome have been so strong without its Forum? The marketplace of ideas has long been seen as a virtual space, embodied within books and academic publications. However, this fails to recognize the role of informal social networks as information networks and social exchange as information exchange.

#### *PARTICIPANT ARCHITECTURE*

Individuals and groups of people can be important architectural elements—humans are a media form. The style or personal habitus of the people in a bar can be just as important to the architecture as the style of the lighting or the posters on the wall. Not just their clothes, but their posture, manner of speech, interests, etc. All this composes the architecture as a coordinating context for human activity.

## On Economics

#### *ATTENTIONAL CAPITAL*

Human attention, which can be defined as the focused and synchronized cognitive resources of an individual, is a valuable economic resource. Human attention is the basis of productive labor: both the action of machines and the movement of the body requires direction by the attention of the human mind. Attention is a limited resource because an individual can only pay attention to one task at a time. Because of this scarcity, various markets have emerged to allow buyers to contract the focused attention of individuals. For instance, people will pay significant amounts of money for the attention of lawyers, doctors, and other trained professionals. However, there are other, less obvious ways in which attention is traded in society.

#### *ATTENTIONAL RECIPROCITY AND GIFT ECONOMIES*

Attention is traded between people in many informal ways, most of which are based upon reciprocal exchange. Humans have complicated yet effective cognitive systems for keeping track of the attention that has been invested into other people, and how much attention has been paid back. While less obvious in a market

economy, this principle of attentional reciprocity is the principal basis of human society and its economies.

The sociologist Marcel Mauss (date) famously articulated the principle of reciprocal economies in his description of gift economies in Polynesian islands. Although still widespread, before currencies, reciprocal exchange of goods was far more common. This is different from bartering, as there is no quid pro quo; there is no negotiation, only an implicit expectation of return. Should this expectation be broken, the social relationship will be stressed and will eventually cease. Mauss identified large-scale gifts that would be given within the context of a ceremonial or cultural structure. However, he also recognized that a large number of smaller exchanges (food, sex, work, etc) would take place on a regular basis, particularly within the household and between friends. He termed this small-scale gift economy the “total services.”

#### *ATTENTIONAL COORDINATION*

The primary evolutionary advantage of social behavior in humans is the coordination of attention to achieve common goals. Coordination of attention allows humans to hunt as a team, share the burdens of child rearing, and benefit from the accumulation of cultural knowledge. However, this attentional coordination requires the trust of an existing social relationship. Chimpanzees are famous for their reciprocal grooming behaviors, which serve to articulate their network of social relationships. Similar reciprocal gestures of attention also exist in humans.

#### *ARTICULATING SOCIAL BONDS THROUGH ATTENTIONAL EXCHANGE*

The reciprocal exchange of attention between individuals is a necessary and sufficient component of social relationships. Social relationships are constantly tested and evaluated for their reciprocal response. Whether through emails, Myspace comments, text messages, or phone calls, our modern technology often serves as a medium for the expression of this reciprocity. However, more ancient conversational conventions are also mediums for reciprocal exchange. Small reciprocal gestures, like the nod

of a head, a wave or a high-five, are used to demonstrate the existence of social bonds. Most are familiar with a situation where attention has been given, and none returned, generating a significant emotional response. This is particularly true in human mating, where attentional reciprocity is a principle factor in the dynamics of a couple. Whether flowers, phone calls, or glances of the eyes, attentional gestures are traded back and forth in an interplay that is used to indicate the mutual attraction, trustworthiness and personal character of the potential mate.

#### *ATTRACTING ATTENTION AND EVOLUTIONARY SUCCESS*

The ability to attract and cultivate the attention of a desired mate is the primary factor in human (and non-human) sexual selection and evolution. Humans learn to attract and manipulate the attention of others from the moment they exit the womb and begin crying. During the course of childhood, there is an evolutionary pressure on children to cultivate the attention of their parents, and then peers, to gain access to resources. The success of individuals in society is largely dependent upon their ability to attract and utilize the attention of others. Humans need the attention of other people to conduct their work—in a modern society, we rely upon the attention of millions of other people, as we navigate through a material environment that has been built through the coordination of the attention of those millions.

#### *MEDIA ECOLOGIES*

Human society operates as a massive ecology of attentional competition. Humans aren't the only ones competing for the attention necessary for their reproductive success: Media objects also depend upon human attention for replication and propagation.

#### *THE ENGINES OF MEDIA DISTRIBUTION*

Why do people replicate and propagate media that they find valuable? Altruistically, sharing valuable media creates more value

in society. However, individuals have several incentives for redistributing relevant or valuable media to our social relations. One incentive is reciprocity: sharing good media with our social network improves the chances of receiving relevant or valuable media back. Another incentive is identity construction: individuals share good media because they seek to be co-identified with it. Another incentive is that people want their friends to be culturally coordinated: people spread awareness of media they like, in the hopes that individuals in their network will also like it, strengthening social bonds.

Take the example of an individual telling a story at a party: if the story is subjectively valued to be interesting, relevant, or funny, the person telling the story is identified with the same characteristics—and the social ties they share with their listeners are strengthened. Furthermore, the listeners are identified as people who have friends who tell good stories. Telling a good story can generate a sense of obligation in the listeners to reciprocate with a comparably valuable story. However, if a listener perceives the story to be boring or offensive, the person telling it is identified with these characteristics. The social tie is weakened, as the listener does not want to be identified as a person who is friends with people who tell bad stories. When people share media, they put their reputations on the line, for better or worse.

#### *MEDIA AS TOKENS OF SOCIAL RELATIONSHIPS*

If a person sends a friend a funny greeting card, both the recipient and the sender are co-identified as sharing the sense of humor in the card. The media object functions as a physical token of the social relationship between the people; both sender and receiver experience the other person through the media object and nature of its exchange.



## On Music Theory

### *LIQUID ARCHITECTURE*

Goethe compared architecture to “frozen music.” Extending this metaphor, music is “liquid architecture.” Both architecture and music have a unique capability to synchronize human consciousness within a shared time-space.

Music is well known to be an organizing principle for social interaction. Music is common at parties, both for its relaxing effect as well as for its ability to coordinate social interactions. Different kinds of music can facilitate different kinds of social interaction, e.g. soft classical music or fast electronic dance music. Because human cognition synchronizes to the beat of the music, social interaction is facilitated, because it is easier to predict and synchronize with the cognition of other people. In this manner, music acts as a scaffold for social interaction.

### *HARMONY*

While musical scales have many cultural factors, there is a common sense of musical harmonies based upon the mathematical congruence of frequency patterns. In all scales, a note that is one octave higher than another is roughly double the frequency: in western scales, an “A” is generally tuned to 440hz and its octave is at 880; an octave below is 220. If imagined as a sine wave, the peaks of the faster frequency would align to the peaks of the lower frequency every other time, for a ratio of 2:1. The third interval (A and C, for instance, or any two major notes separated by one note) is a very harmonious interval; the frequency ratio is 3:2. The second interval (A and B, for instance) is very dissonant; the frequency ratio is 291:1. Notes of music can be considered puzzle pieces that can “fit” well together. Composers use melody to construct harmony (resolutions) because our short-term memory enables musical notes to fit together, even when separated by the space of time.

Rhythms, timbre, notes—all musical elements—are joined together into the coherence of a song through the congruency of their frequencies.

### *PERCEPTUAL FUSION*

In the brain, all the music elements are perceptually fused into a single expression of emotional meaning. Music is unique among the arts for its occasionally direct coding of neurological signals. Whereas visual images must be translated into interactive temporal frequencies of neuronal firing, music is largely encoded within the brain as a set of neuronal firings that reflect the same temporal frequencies that are transmitted through the air. And yet, our brains have limited capacity to comprehend complex signals—which can be demonstrated if one listens to two songs at once. Instead of understanding the meanings of the two songs individually, the mind instead fuses the songs together, whenever possible. For this reason, when the mind (which is constantly seeking meaning) hears a hundred instruments playing at an orchestral performance, it perceptually fuses the sounds into a single melodious entity. When the mind is unable to fuse (and make harmony of) the sounds, it can be dissonant, frustrating, and unpleasant (Leherdal, [date](#)). When the sounds do harmoniously resolve into a comprehensible form, music can bring immense joy to the listener.

### *NEURONAL HARMONY*

While musical pleasure is not derived from a single factor, there is a neurological correlate to harmony that warrants discussion: the Hebbian learning principle. Hebbian learning is often paraphrased as “neurons that fire together, wire together.” Each neuron has a tree-like set of dendrites that receive signals from the axonal projections of other neurons. When the signals received by the dendrites surpass a particular threshold, the receiving neuron will fire and send signals to the neurons connected to its axonal projections. Hebbian learning occurs at the synaptic connection between each neuron and the neurons connected to its axon or dendrites. When neurons fire synchronously at the same frequency, growth factors are released into the synapse, strengthening the connection. When neurons fire at significantly different frequencies,

the synapse eventually weakens. If a neuron fails to synchronize with its neighbors, they will disengage their connections, and this neuron will retract and die. As many as 1/3 of all neurons are lost in this way during adolescence (reference).

#### *HARMONY IN NEURONAL ECOLOGIES*

Hebbian Learning posits a highly Darwinian ecology of synchrony (Edelman, date), where the survival of the fittest is determined by the degree to which neurons, and their firing frequencies, “fit” the frequencies of their neighbors. Each neuron clearly has an incentive to have synchronous firing patterns—or it will be socially shunned by its neighbors. It is notable that this neuronal ecology is comparable to social ecologies among humans. However, this relative “fitting of frequencies” is most comparable to the musical nature of harmony, as described above.

#### *JOY OF CONSONANT MAPPINGS*

Joy is the pleasure felt when a desired state of experience (a goal) is achieved. Desires are motivating because they are uncomfortable. This discomfort comes from the dissonance perceived in the comparison between two mental maps of experience: the mental mapping of one’s current state of experience and the mapping of one’s anticipated state of experience—a state that is valued more highly than the current state. When we imagine a goal, we also tend to imagine the intermediary steps (or sub-goals) necessary to achieve the primary goal. As we pursue the primary goal state, and we achieve resolution of the sub-goals, we feel a sense of joy—this is both the joy felt in the closer anticipation of the primary goal and the joy felt in the accomplishment of the sub-goals. When we finally achieve the primary goal, the previously perceived dissonance is resolved: the map of the desired state of experience and the state of current experience is congruent. This congruency, or harmony, between the two maps of experience produces a feeling of joy. This congruency and harmony results in learning, as a result of the

strengthening of the connections of the neuronal circuits involved, in according to the principles of Hebbian Learning.

For example, consider the simple goal of putting a golf ball into a hole. The golfer always imagines the goal state, which is a vision of the ball rolling along and falling into the hole. The golfer also imagines the sub-goals of pulling back the putter and feeling a certain amount of force upon the ball. As the golfer enacts these movements, he/she is constantly comparing the intended actions with the actual actions—when these mappings align and the sub-goals are achieved, it typically “feels good.” If the golfer misses, he/she feels the dissonance of the incongruity of the map of desired experience and the map of actual experience have: this dissonance and displeasure is useful cognitive feedback—over time, it may weaken neuronal connections that are not contributing successfully to goal completion. When the golfer successfully makes the putt, the joy felt is inversely proportional to the degree of certainty that he/she felt about the stroke (it feels better to achieve a 10 foot putt than a 2 foot putt).

For a slightly more complex example, consider the joy felt during videogame play. The gameplay is built out of a set of sub-goals, such as avoiding obstacles or hitting enemies. As these actions are successfully achieved, they produce joy—unless the game is too easy and becomes boring. In fact, it is typical that the more challenging a game is, provided that a player can still improve quickly enough to meet the challenge, the more fun the game is to play.

#### *MELODIC MOVEMENT AND MUSICAL JOY*

In western music, a *tonic* is a harmonic chord of several notes that is the foundation of the melody. The first few notes establish the tonic in a mental map of pitch space; and then the melody diverges from the tonic, creating dissonance in the mental maps (Huron, date). This dissonance creates a sense of melodic movement towards a resolution with the tonic. The joy of music seems to be derived from the same types of consonant mappings as described in goal-oriented behavior above.

# On Art Theory

## *PARTICIPATORY ART*

*Participatory Art* generally refers to a history of artworks that involve the audience in the co-production of the forms that are central to the experience of the art. Participatory Art is particularly identified with the Fluxus art movement of the 1960s. Famous examples of Participatory Art were recently exhibited at the SF MoMA's 2009 "Participatory Art" exhibition. These included Nam June Paik's microphone TVs, John Cage's 4'33" (a silent piece that focuses attention upon the ambient sounds of the audience), (name) Video Hole, and (name) Drinking Beer with Friends is the Highest Form of Art.

Yoko Ono's "Cut Piece."

Guy DeBord's *Situations* and *Psychogeography*

Alan Kaprow's *Happenings*.

Joseph Beuys *Social Sculpture*

## *RELATIONAL AESTHETICS*

*Relational Aesthetics* is an aesthetic theory that is concerned with the analysis of artworks that catalyze new relational structures within an audience. This theory was proposed and developed by Nicholas Bourriaud (2002) to bring attention to the conceptual novelty of a set of artists practicing through the mid-1990s.

Examples

Poster piece,

Bourriaud believed that all art can be seen through the lens of relational aesthetics. For instance, even a painting on a wall could be judged by the effect it has on the interactions of individuals in the room.

## *DIALOGICAL AESTHETICS*

*Dialogical Aesthetics* is an aesthetic theory that specifically considers artworks that seek to generate new forms of social dialogue and connectivity between audience communities. This theory was developed by Grant Kester (2004) to provide a framework for evaluating artwork that engages social or community interactions. He provided a history of art criticism in order to position dialogical works within the same frame of reference as other modern works. Dialogical works extend the modern history of art because they disrupt existing conceptual comprehensions of the world. Kester posits equitable or reciprocal empathic engagement as a central criterion to the evaluation of dialogical work. For example, Ethnographic depictions of environments

## *AESTHETICS AND ETHICS*

Relational art is judged according to the liminal factors of ethics and aesthetics. Art that changes behavior is necessarily subject to ethical consideration. In so far as the aesthetics of the work are based upon these behavioral changes, the aesthetic and ethical theory fuse.

However, Art is not in the business of proposing what should be or how humans ought to act. Rather, Art is the exploration of what could be; it seeks to extend the possible range of human experience and comprehension (and, more often than not, the range of human incomprehension).

#### *APPROACHING A COMMON AESTHETIC SENSE*

Relational Art pieces could be considered experiments that explore and provoke the range of human social interaction. The recent history of art is the history of aesthetic disruption—consider Mondrian’s paintings or Warhol’s 12 hour films. An important, new work of art is aesthetic according to the degree to which it disrupts other aesthetics. This disruption allows for the reorientation of the human mind. This cognitive flexibility bestowed by the appreciation of art

#### *ART LIKE CHILDREN’S BOOKS*

It seems that by warping a child’s sense of reality, children’s books can enhance their sense of imagination and develop their cognitive worldview. A notion of aesthetics, and art, as based upon cognitive disruption. just the same,

#### *EPISTEMOLOGY AND ART*

Art is more than an exercise, it is also an epistemology. A person’s knowledge of art enables them to evaluate new aesthetic

experiences. We can therefore build our aesthetical evaluation apparatus upon certain epistemical “historical touchpoints”. Our experience with prior art shifted our perceptions of what art could be and how it could be evaluated. Those historical touchpoints form a network of perception that allow us to contemplate a novel art piece. They form an inter-cognitive network of epistemic reference points between art experts. Artists seek to produce art that serves as a new conceptual/aesthetic reference, a niche within the socio-ecology of the world of art appreciation. Art is an epistemology about itself. New art production is like epistemic research, seeking to extend our shared socio-cognitive network of aesthetic knowledge.

Fun is the joy of the challenge of novelty. Toys are fun because of the joy of the challenge of novelty. Joy from challenge is what makes games fun, as well. It is also what drives us in our personal careers and everyday behaviors. We have been evolutionarily equipped to enjoy challenge, but it must be a challenge we want to meet.

—about itself. Art reflects its own history.

Epistemology is “the branch of philosophy that studies the nature of knowledge, in particular its foundations, scope, and validity.” (Encarta, 1999)

Congruency between concepts. When two concepts, or arguments, are positioned together in the mind, they must be congruent. If they are dissonant, or don’t “fit” together, they will compete for dominance.

#### *CONCEPTUAL AESTHETICS*

Musical aesthetics seem to derive from certain mathematical relationships between sound waves and neurons. Visual aesthetics also rely on certain consistencies and mathematical properties. But what of

the aesthetics of a concept? Or a society? What makes a certain conceptual art piece aesthetically excellent? How would an exercise in relational aesthetics be judged good, or bad? Are these senses of “aesthetic” even comparable to the classical aesthetics of painting and song?

## Kester talks of “The Common Sense”

### A DEFINITION OF SCIENCE

“Science” is a highly formalized epistemic process for building theoretical knowledge about the essential nature of the world. Science is also a sociological structure of academic professionals that see themselves as building a domain of universal knowledge, based upon shared empirical observation. The primary effectual act of Science is the publication of the work, which necessarily contains theories, methods, evidence/experiments/observations, and references. The value of a publication is based upon the consensus of relevant experts, often through citation.

### ART: A DEFINITION FOR A COMMON TERM

What is art? What is not art? Anyone can make anything art, merely by intending for it to be art. It might be bad art, but it is at least in the domain of comparison. “Art” then, might be usefully distinguished from “High Art,” which is a specific societal institution. High Art, like science, is a network of experts working to advance a domain of knowledge. High Art is a domain of knowledge about the history and future of artists and aesthetic appreciation. The primary effectual act of high art is the exhibition of artwork, which requires an audience (and probably an audience of high art professionals), intentional gestures by an artist, and a framing context like the gallery, theatre, or street. The value of exhibited work is based on some of these inter-relating factors: artist prestige, critical reference

and precedence to future works of value, attraction of a public audience, and the work’s ability to be converted to other forms of value (market price, social/institutional access, etc).

### WHAT ISN’T ART?

The term “Common Art” could be used to describe media, the artifacts of human communication. In other words, *common art* is media, whether a photograph, a book, a song, an advertisement or even a performative gesture. All these media forms consist of human intentionality embodied within a physical artifact. The practical dimension of common art includes the semiotic meanings encoded in the media and the utility of their signification (as in books, TV programs, billboards, exit signs, etc). The aesthetic dimension of common art is the empathic dimension— aesthetics are what enable a person to appreciate or self-identify with a media object. A viewer can develop an emotional relationship with a media object separate from their understanding of the semiotic significations (i.e. a person can like one graffiti tag more than another, while understanding the semiotic content of neither). The aesthetics of common art are important because they can enhance or diminish the efficacy of the semiotic content, e.g. this is why advertisers invest so heavily in aesthetic design. Aesthetics enable individuals to co-identify with one another (through, for instance, popular fashion or music) and to communicate emotions through non-semiotic empathic engagement. Aesthetics are the empathic dimension.

## Conclusion

The Social Movement Laboratory was established to provide a productive dialogue between science, art, and social activists. By producing new modes of observation, such as *RealTimeLapse*, *Point Light People* or *BioMemetics of Myspace*, we are able to explore new, technologically mediated forms of empathic engagement with society. By actively engaging a social design and interventionist art practice, as with *Social Architectures* or *The Playpower Foundation*, we are able to iterate upon our successes and failures to learn more about the relationship between form and sociability.

“So we need to pay attention: we know that attitudes become forms, and we now have to realize that forms induce models of sociability”

Nicolas Bourriaud, 2002

### INTENT OF SOCIAL DESIGN

Social Design seeks to change society through the design of media interventions.

Designing for social alteration and change.

### AESTHETICS AND ETHICS

The aesthetics of a social intervention are its ethical implications

Design can result in a better society. Both ethics and aesthetics place value judgments on human behavior and its products. Ultimately, ethical theory is based upon the sort of world we want to live in.

The ethics of social design: design will always influence behavior. Social design is specifically seeking particular forms of behavior,

and as such, it engages ethics. It questions: If we, as social designers, can generate particular kinds of human behavior, what kind of behavior ought we produce? Should we always encourage social engagement? When is it appropriate to design for disengagement? What kinds of engagement and disengagement?

### ART AND THE CREATION OF SOCIAL VALUE

Is art “allowed” to try to do good in the world?

Avoiding the “orthopedic” approach to community art, but still trying to pose aesthetic experiments that could create a better world.

As we seek to find a sustainable world that must be predicated upon day-to-day human relationships, relational art can help us experiment with innovative new structures of human interaction. deliberate dialogical interventions could help create a better society.

### GOALS

Facilitating dialogical empathic engagement between diverse groups of people. Helping people build social ties and share identity can connect and coordinate society. Enabling new topologies of media exchange: participatory spaces and bottom-up interaction. Creating a connected and coordinated collective consciousness. Integrating art and science

### ART AND SOCIAL EVOLUTION

Art can contribute to the ecological stewardship of human society. Pursuing a unified world that nevertheless respects diversity by recognizing its essential role in maintaining the strength of the global social ecology. Art has long explored, and defended, alternative social spaces. It can introduce ideologies of alterity and coherence. The primary role of Art is the induction of aesthetic coherence, congruity and connectivity in society. Art allows an audience to cohere through its common comprehension of a piece. It introduces a “common sense and sensitivity” to the world.

Modern art has long sought to catalyze the evolution of human consciousness through the shock and subliminal awe of incomprehension. Breaking people out of the mesmerizing effects of capital-oriented routines (work, advertising), allow alternative ideologies of movement and interaction to be introduced.

Through the disruption of prior conceptual and aesthetic frameworks, new formal apprehensions can emerge. This approach can be applied to society: existing social formations can be disrupted, so that they can reorganize in response to the present demands.

However, what should replace these capital-oriented routines? Communism has failed miserably, and anarchy tends to revert to some of the worst excesses of unrestrained capitalism. Religion has long sought to create goal-spaces that serve as an alternative to capital markets. Art and philosophy. Academic epistemological achievement. Attentional capitalism. Politics. Art is based on attentional capitalism. The evaluation of an art piece has much to do with the social structures that orient around... An art opening is a party. These parties are the primary mechanism that govern the evaluation of art. Who is in attendance and who likes the piece?

#### *THE EVOLUTION OF MATERIAL HARMONY*

If the ~13.5 Billion years of the universe can be viewed as a narrative, what is the story? Whereas the universe began as an undifferentiated pulse of pure energy, the world today is vastly more complicated and rich.

Harmony has long been considered in the role of beauty and aesthetics, in more domain than just music. According to the classical theories of beauty, harmony is a “multitude in unity.” Harmony is the interactive fusing of elements into a greater whole, whether in the instance of a building, a theater performance, a painting or a song.

#### *THE SUPER-ORGANISM*

Biologists consider some social organisms, like the honeybee, to be living organisms at 3 levels: the level of the individual cell, the level of the individual honeybee, and the level of the hive. The hive is referred to as the “super-organism.” Heretofore, individual molecules or honeycombs are not typically seen as “alive”—but within the context of life, they inseparable from it. A honeycomb is a living part of a super-organismic hive, just as the extra-cellular matrix is a living part of a bee or as the molecules are a living part of a cell. Similarly, our human architectures and technological media environments are living, organic structures; if we care to, we can see our skylines and social websites as the literal secretions of the human super-organism.

The human super-organism is experiencing a period of rapid evolution—it has just recently been connected through an earth-wide digital communication network. It would not be unwise to consider that this super-organism could develop self-awareness, perhaps as comprehensible to individual humans as a human is to individual neurons.

#### *FACILITATING EMPATHIC ENGAGEMENT THROUGH ART*

The world is far too complex for an individual human to understand.

Science has produced an increasingly complex set of understandings about reality, from the scale of quantum physics, to cellular interactions, to climatic change.

Art may serve to trigger a greater understanding of this world through the crafting of emotional-aesthetic intuitions. As opposed to scientific rational explanation, art can create a deeper-than-rational ‘sense of reality’ through *empathic engagement*.

Needing to understand the scale of human society. Needing to understand the predictability of human behavior. Urban design, fastfood, etc. Why aesthetic contributions from space syntax can be so powerful.

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