Mapping the Frame: Locative Media and Interactive Art Environments

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In this paper we will be examining the relevance of interactivity, locativity and visualization to the process of making computational art. In addition we will be making much needed interconnections between instances of modern and contemporary fine art and interactive and locative art. Such connections are necessary due to both the rudimentary aesthetic condition of new media art and the elitism that still accompanies fine art. Connecting the two fields can provide benefits to both.

The instances of new media art we will be examining in this essay represent attempts to create new ways of seeing analogous to the artistic revolutions that occurred when artists first experimented with photography and cinematography. We will also argue that there is a significant relationship between the code-driven nature of much new media art and the phenomenon of abstraction in early twentieth century visual culture. Finally, we will argue that the immateriality and interactive potential of new media art holds out the promise of finally overcoming the hierarchical condition imposed by the art museum in which the position of the viewer is distinctly inferior to that of the work of art.

One of the enduring goals of avant-gardist art from Dada onward has been to deconstruct the barrier between the viewer and the work of art (Bürger 1984). But attempts to achieve this have been persistently defeated by the fine art system wherein even a public convenience urinal such as Marcel Duchamp's *Fountain*, 1917, is transmuted into the traditionalistic precious *objet d'art—Fountain* recently sold at auction for over a million dollars (www.artprice.com). The transformation of virtually any form of artistic production into extremely precious objects means that visiting an art gallery/museum is akin to visiting a bank vault. The visitor is constantly watched by guards and CCTV and segregated from the precious objects by means of a variety of barriers.

During the 1960s a great deal was made of the 'phenomenological' involvement of the viewer with minimalist sculpture. But in reality this involvement was not dramatic and reached its high point when one was allowed to walk on Carl Andre's metal tile sculptures. It is rare to be offered the opportunity of doing that today. But art at the turn of the millennium has been marked by a burgeoning installation art movement which is the latest attempt to involve the viewer in the work of art.

Most texts on installation art put forward the thesis that installation offers a greater degree of viewer participation. Accordingly Claire Bishop suggests that installation art is 'the type of art into which the viewer physically enters and which is often described as "theatrical", "immersive" or "experiential"' (Bishop 2005: 6). In reality the majority of installations are not that different from traditional sculpture. One can cite for instance Jason Rhoades and Paul McCarthy's *Sheep Plug*, 2004, installation at the Dionysiac exhibition at the Centre Pompidou, Paris, 2005 (Macel and Centre Pompidou 2005) in which a great deal of junk-like material was spread out across a gallery floor. But as both artists now possess superstar status their 'transgressive' 'anti-art' stuff has been transmuted by the fine art system into precious objects. Accordingly, visitors had to be

channelled by a path through the detritus delineated by tape stuck onto the gallery floor. This created an experience not unlike that of looking at a sculpture on a pedestal. And this lack of immersion and segregation of the viewer from installation art is not uncommon.

Indeed one can criticize contemporary installation sculpture on the basis that it aspires to a more intimate viewer experience yet at the same time is more intimately allied to the fabric of the gallery apparatus than has ever been the case before. The Dadaists attacked the institution of art as did artists of the 1960s. But at the turn of the millennium there has arisen a new complicity between the so-called avant-gardist artist of today and the capitalist art system that has the power to transmute virtually anything into an extremely precious object.[1] Capitulating, however ironically, with traditional concepts of artistic value ensures that fine art will remain elitist and segregated. In addition, the fact that most installation art is sculptural in character means that it will inevitably be transformed into a precious object and become sealed off from the viewer. New media in contrast offer a means of production that is *inherently* interactive.

The technical means of creating viewer participation in new media art can be as simple as a mouse or touchpad. In more elaborate gallery installations more sophisticated sensors can be used such as web cams and floor pads. Such sensors detect the movement of people in the viewing zone of the work of art and use this data to either cause alterations in the artwork being displayed or, alternatively, to generate a visualization of this movement. Locative art is an extension of such interactivity that uses devices such as GPS tracking to create a much larger zone of data collection. It is also generally the case that locative art often uses the data collected to create the visualization rather than simply altering an already existing data-driven work of art.

The degree of active participation in an interactive work of art is proportional to the degree of influence the viewer-participant can have on the work of art and to the degree of awareness the viewer can have of his or her participation. Moving one's finger on a touchpad to interact with online art is generally a fairly limited degree of interactivity. Interacting in a gallery space via web cam sensors and positional analysis creates a much more powerful effect. One of the most successful seminal instances of gallery-based interactive art is Jeffrey Shaw's now classic new media art work *Legible City*, 1989 (with Dirk Groeneveld). In this work one rides a fixed bicycle the speed and direction of which effects where one travels in a computer generated city (made out of 3D letters) projected on a large screen ahead of the rider. The principal effect of this work was one of being *embodied* in the 'legible city'. One has a palpable sense of physical relationship with the image on the screen to a degree that is rare when viewing traditional fine art media.

Riding a bicycle in a virtual city may not appear to be particularly profound, but it is considerably more engrossing than walking on Carl Andre's metal tiles. One could accuse *Legible City* of being a primitive instance of interactivity but that accusation merely points to the even more primitive nature of the dissolution of the boundary between viewer and art object evident in most instances of sculptural installation art at the turn of the millennium.

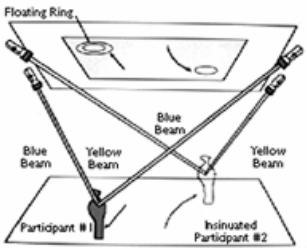
There are exceptions, however: one can cite, for example, the use of immersive, natural/artificial and social/cultural systems in the installations of Ann Veronica Janssens and Olafur Eliasson and the psychophysical experiments of Carsten Höller. These artists do not deploy 'new media' but they do achieve genuine immersive experiences. In particular, they enable a situation in which the viewer can cross over from the traditional way of seeing art that is the segregated, disembodied gaze to a more embodied way of seeing.

Olafur Eliasson, *The Weather Project*
Tate Modern, London (2004)

Jeffrey Shaw, *Legible City* (1989)

They create a situation in which the boundary between subject and object that is so intensified by the art museum apparatus is actually eroded. What the art of Janssens and Eliasson indicates however is that sculpture needs to be expanded to breaking point to achieve this goal. We will argue that new media art—in contrast to the *objet d'art* of painting and sculpture—is *inherently* able to attain a more embodied phenomenological engagement due to the way in which technologically assisted prosthetic vision is able to penetrate deeper not only into the object but also the subject.

A work that explores new media embodiment even further than *Legible City* is Rafael Lozano-Hemmer's *Trace: Telepresencing Across the World*, 1995. *Trace*, 1995, is an interactive-locative work that is impressive even ten years after its initial construction, due to the fact that it can interconnect the physical presences of two people who can be a world apart. And the interpersonal, or 'relational' (Boudourides 1995) nature of *Trace* underscores the connection between embodiment and empathy.



Rafael Lozano-Hemmer, *Trace*
Fudacion Telefonica, 1995, 2000

Trace consists of two rooms and two participants. These rooms could be on opposite ends of the globe. Each room is designed to record the movements of the local participant and to simultaneously display the movement of the remote participant. One enters a darkened room equipped with a location tracking device which will transmit to the remote room via a telephone line in real time.

The movements of the remote participant are visualized to the local participant in various ways: Firstly, there are white and blue robotic spotlights. The blue spotlight projects the position of the local participant onto the floor and the white shows the location of the remote person. Fog is introduced into the room to enhance the effect of the moving light beams. Secondly, speakers surrounding the room give the local participant positional sound feedback regarding the location of the remote participant. If the remote moves to the right the sound moves to the right. If the remote person moves closer to the local person the sound gets louder. Thirdly, there are two data screens on the wall of the room that show the relative positions of the participants via dots and

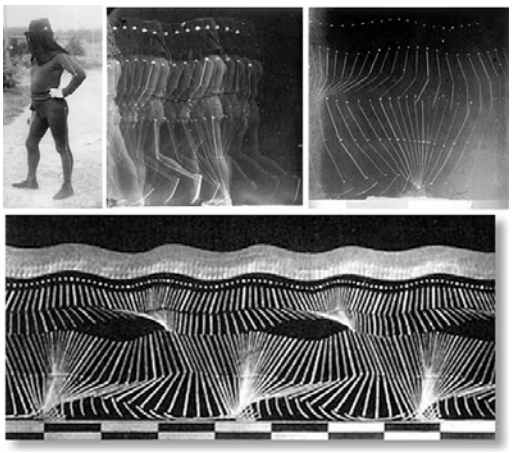
graphs. Finally the entire ceiling is a screen showing an abstracted 3D computer generated visualization of the relative positions of the participants. The local is represented by a disk and the remote by a circle; when the two reach the same coordinates the circles encompasses the disk. Lozano-Hemmer uses the term ‘telembodiment’ to describe the point at which the remote and local participants might share the same coordinates. And the entire installation is designed to explore a new dimension of telecommunication that extends beyond sound and vision to the sense of bodily presence. It is obvious that Lozano-Hemmer wants the multiple feedbacks to transcend their abstraction and result in a sense of shared physical presence.[2]

The Viewer as Work of Art

One of the major differences between *Trace* and *Legible City* is that *Trace* generates a visualization of the bodily presences of the viewers whereas *Legible City* provides a readymade visualization that the viewer can enter. Both strategies are equally valid but it is certainly the case that generating a visualization out of the data provided by the viewer is even more viewer-oriented. *Trace* not only breaks down the barrier between the viewer and the work of art it makes the viewer the work of art via a process of visualization.

Visualization of the viewer(s) can take many forms one thinks for example of Dan Graham’s use of devices such as glass walls that reflect an image of the spectator but also reveal people beyond, or his use of time-delayed video which would show the visitor on a monitor but with a time lag of thirty seconds. Devices such as these were designed to destabilize the viewing experience thereby making the viewer more aware of the act of perception. Graham also wanted to focus attention of the social nature of the viewing activity by revealing the relationship of the viewer with other viewers in the gallery space.

One can, therefore, understand the exploration of the viewer as a valid subject matter for artistic experiment. And one can trace the history of the concern with the viewer back to speculation on aesthetic experience that began with the modern period in the work of Immanuel Kant (Kant and Meredith 1952)and the psychophysical psychology of the nineteenth century such as colour theory which played a significant role in the development of abstraction (Argüelles 1972). In addition to colour theory nineteenth century psychophysical investigations perception also examined the dynamic effect of line. But from the point of view of contemporary interactive art the most remarkable experiments were carried out by the physiologist Etienne-Jules Marey (1830-1904) and the photographer Eadweard Muybridge (1830-1904) both of whom pioneered chronophotography, or what we would refer to today as ‘motion capture’.



Etienne-Jules Marey chronophotographic analysis of a person walking

Marey's work in particular enabled a new conception of the human body as a highly coordinated and complex field of forces operating in space and time. His abstracted visualization of the human body in motion inspired Giacomo Balla who embarked upon a series of Mareyesque abstract visualizations of 'speeding automobiles' and Marcel Duchamp was inspired by Marey to create his Cubo-Futurist masterwork *Nude Descending a Staircase*, 1913. Marey's abstractionistic analysis of the human figure in motion dovetailed perfectly into the deconstruction of classical, Euclidean, space and time evident in Analytical Cubism. In place of the classical sense of order Cubism introduced modernist vision. Modernist vision—or what the Constructivist artist Laszlo Moholy-Nagy's referred to as 'the new vision' in his 1929 book of the same title (Moholy-Nagy and Hoffmann 1946)—focuses a scientific gaze upon the human subject. Michel Foucault has noted that the modern concept of 'the subject' stems from the birth of the human sciences in the nineteenth century and for Foucault this introduced a new conception of what it was to be human (Foucault 1970) (Foucault 1972).

Marey and Muybridge's chronophotography can be understood in the context of post-classical notion of the human seen now not as a heroic statue but in the case of Marey's work as a field of forces that the Futurists would surmise was part of the larger field of forces that was the noise bustle and energy of the then emerging metropolis.

In 1936 Walter Benjamin wrote the first text on new media art—'The Work of Art in the Age of Technical Reproduction' ('Das Kunstwerk im Zeitalter seiner technischen Reproduzierbarkeit')—in which he pointed out that the new technical vision of photography and film could penetrate more deeply into the fabric of nature than was possible with unaided human vision (Benjamin 1973). What Marey in particular revealed through his technical visualizations was that technical vision could not only penetrate the object but also the subject leading to a condition of interpenetration that is especially important for a consideration of interactivity in new media art.

If the input of interactive art is the human subject and the output is a visualization of that subject then we can also consider what happens in between. The in between in this case is akin to the creative process but new media art has introduced a new member to the case in the form of code. One can note that the typical software used by artists involved in new media art—such as Java, Processing, Lingo (Director), ActionScript (Flash), and Javascript—all deploy code. Code is the zone in between the input and the output, it is the space in which algorithmic transformations, translations and transpositions are imposed on the incoming data.

Abstraction is the most salient characteristic of the code that drives contemporary digital art. And the processes of abstraction employed by De Stijl and Constructivism can be also understood as a species of encoding: translating the world into a metalanguage that can be manipulated in entirely new ways. The reduction of representation to geometric forms evident in De Stijl, Suprematism and Constructivism is akin to the way in which mathematics can manipulate aspects of reality when such features are translated into highly abstract terms. It is also akin to verbal language which likewise translates objects and processes in the real world into an abstract system allowing manipulations to occur in a conceptual rather than actual space-time.

The rise of code based art in the 1990s has led to a quiet renaissance of abstraction (quiet because digital art plays a very minor role in the commercial gallery system that is the engine of artistic reputation). Artists such as Mark Napier, Scott Snibbe, Martin Wattenberg , Camile Utterback, Kevin McCoy, Russell Richards (www.hidrazone.com) use code to create abstract patterns that interact with the viewer. Some of these experiments seem simplistic others are richer and multilayered. Code based abstraction is similar to painterly

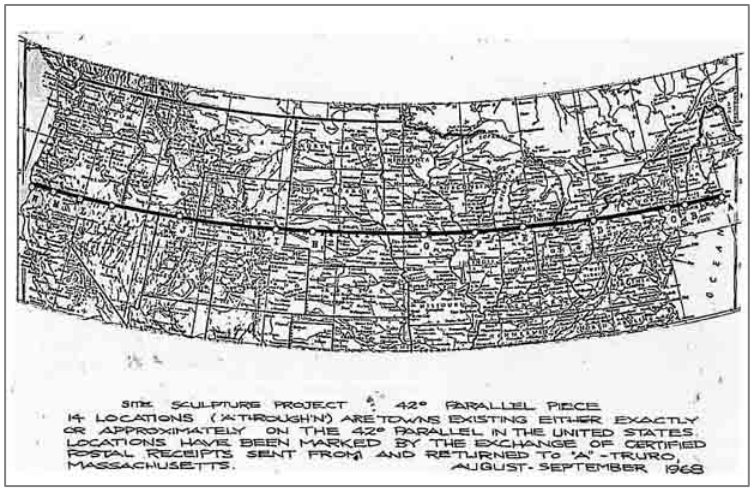
abstraction in its use of colour and form. Yet it is also significantly different on at least three scores: 1. It is interactive, 2. It is dynamic, and 3. The code that drives the imagery is a notational form akin to musical notation.

```
sprite(spriteNum).trails = true
pAngle = random(360)
startH = random(440)+75
startV = random(280)+75
if random(2) = 1 then
pAngleVector = -1
else
pAngleVector = 1
end if
if voidP(spriteList) then spriteList = []
if sprite(spriteNum).visible = true then spriteList.add(sprite(spriteNum).spriteNum)
end beginSprite
on enterFrame
```

Lingo code from an interactive abstract work by Kevin McCoy

The last point is interesting because it suggests that there is an additional conceptual, 'mathematical' dimension to code-based interactive abstraction that links it not only to the intersection of art and music, and the equation of geometry and intellect evident in early twentieth century abstraction, but also to concerns with information processing evident in Conceptual Art of the 1960s and '70s.

In the domain of fine art, abstraction enjoyed a long reign as dominant discourse. But during the 1960s it was displaced by the mosaic of radical art movements that arose in the 1960s, such as: Nouveau Réalisme, Fluxus, Pop Art, Minimal Art, Arte Povera, Land Art, Performance Art, and Conceptual Art. Some of these movements are relevant to interactive and locative art. We have already mentioned the emphasis on phenomenology evident in Minimal Art; one can also cite the seminal locativity of Land Art which took art out of the ivory tower of the gallery, as did 'happenings' and performance art. All such movements are of use in the task of theorizing contemporary interactive and locative art. One can cite for example the poetic locative works of Richard Long and Hamish Fulton. But it is to Conceptual Art that we must turn for a mode of art that combines considerations of aesthetic form with notions of systems and information that seem particularly relevant to contemporary new media art. In the next section we would like to focus in particular on a work by the conceptual artist Douglas Huebler: Duration Piece #9.



Douglas Huebler, *Duration Piece #9* (42 Parallel) 1968

Douglas Huebler, Duration Piece #9

Duration Piece #9 is especially relevant to a consideration of contemporary locative art. This work consisted of the mailing of a box to six locations across the USA. On being returned as undeliverable the package was left altogether intact, enclosed in a slightly larger container then sent to another destination. When it was returned again, Huebler continued the same process, selecting addresses which formed a straight line joining the east and west coasts of the United States. The fundamental idea appears to be that of transposing the abstract artistic/mathematical concept of a line into geographical terms. Huebler's delineation of a line across the middle of the USA resonates with the imaginary lines of latitude and longitude that we have projected onto our planet: lines that exist in an extraordinary space in between the imaginary and the pragmatic.

Huebler's work is significant to this discussion because it is not simply a representation; it is also interactive, in the sense of interacting with systems of information in the everyday world, in this case the postal system. It is also visualization because it produces a meaningful articulation of its interaction via its reference to the abstract lines of latitude that are so important to global commerce and defense. Huebler's work also brings us to one of the key technologies informing contemporary locative art the Global Positioning System.

GPS Data Visualization

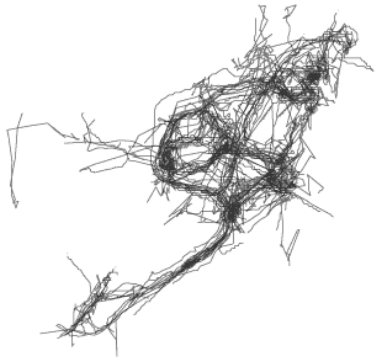
Today we can purchase hand held GPS receivers which will give us precise data regarding our location virtually wherever we might be. Huebler's use of the postal system was ingenious but GPS provides a much greater wealth of data. Like the internet it is an instance of a pervasive phenomenon that spans the entire globe, but unlike the internet GPS is *truly* pervasive due to the fact that it can be picked up at virtually any point on the surface of the earth.

In the same way that Huebler used the technology of the US Postal Service for an entirely different purpose than that for which it was originally intended, we can use GPS for entirely different purposes. For example we can draw and even sculpt with it.

GPS drawing uses the GPS data generated by people moving through an environment. Hand-held GPS receivers can automatically record where you have been as digital dot-to-dot lines. To collect this data one needs to connect the GPS receiver to a computer using software that can read the data. The GPS receiver sends data in a string or sentence that might look something like this:

```
$GPGLL,5330.12,N,00215.31,W,134531,A<CR><LF>
```

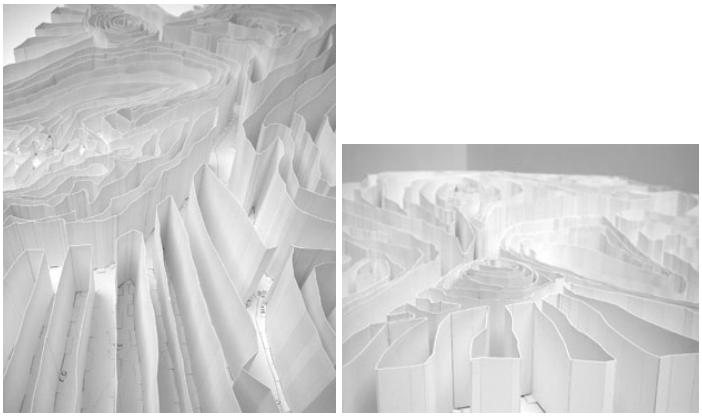
First, there is a NMEA code ($GPGLL), then the latitude, North or South, Longitude, East or West, Time (hhmmss), Data Valid (A), Carriage Return and Line Feed.



A GPS drawing made in a community workshop in which GPS receivers were given to a class of children partaking in a ramble in the countryside. The result is an overlay of the various children's' journeys.

One of the outstanding practitioners in the field of GPS Art is Jeremy Wood. Wood's *Landform Ueda* uses a data collection zone with an area of 3,000 square meters outside Scotland's National Gallery of Modern Art in Edinburgh. The aim of the work is to sense human presence within a delineated public space and use the data collected from the sensors to visualize both individual and collective presence via a representational system such as a large LCD display. In the *Landform Ueda* work participants are provided with GPS receivers prior to going for a walk. The results from the data collected are both aesthetic and informative (in the sense of mapping the most popular routes).

During the course of his experiments with GPS visualization Wood has also created GPS sculptures and 3D animated GPS drawings. This variety of outputs is a significant feature of data art as it points to the fact that the data set is separate from the mode of its visualization. In contrast, conventional modes of representation begin and end with a specific visualization. A data set, however, can be represented in a wide variety of ways. Indeed the separation of the dataset from its mode of representation is similar to the way in which an SQL or XML database functions. In such databases the dataset is broken down into its simplest components which are labeled and stored. But these simple components can be displayed and interrelated in a vast variety of different ways.



Jonathan Wood, transposition of GPS data into a sculptural configuration.

Scalability

In addition to the variety of outputs data-driven art also possesses the ability to operate at different scales. A common feature of both digital interactive and locative art is that a certain space becomes the sensor zone within which the viewer can perform or conduct the event. This might be as simple a space as the touchpad on a laptop used to communicate with an interactive artwork on the web or a CDROM. What is important to realize is that it is not especially difficult to make that dynamic canvas larger by placing the same interactive work on a data projection and allowing interaction via movement in a space delineated by sensors. And locative devices such as mobile phones and GPS make it possible to make that space much larger. Ultimately the dynamic canvas would be the entire globe. What is motivating such research in the field of visualization? Perhaps it is the desire to crawl out of our individual windows and interconnect with a larger community. A central feature of the postmodern world is migration and diaspora: the disintegration of traditional community. Families become split apart by the diasporic demands of finding work in different cities and different countries. Locative and Telematic technologies seem to represent some desire to adapt to this.

Conclusion

New Media remains a seminal field akin to the very early days of photography and film. Even the concept of interactivity is not fully theorized or realized. On the other hand this virtually virgin territory is attractive and exciting principally because it might achieve some of the goals that avant-gardist art set at the beginning of the 20th century namely creating an integration of art with the praxis of life. Traditional media such as painting and sculpture failed to achieve this goal in particular due to the enforced separation of the viewer from the work of art that is the rule in art galleries and art museums. Interactive and Locative art on the other hand are inherently inclusive. Hopefully they will be able to achieve the goal of social relevance that contemporary fine art has largely abandoned.

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[1] One can note for example that Duchamp's famous readymade urinal Fountain 1917 recent sold at auction for over a million dollars.

[2] And this is perfectly possible as is evident from experiments with sonar-like guidance systems designed for the blind whereby a webcam like apparatus scans the environment and translates the edges and brightness into varying tones and pitches. Blind users of the system report that after a period of time their brain is able to process this data so seamlessly and automatically that it is almost as if they could 'see'.