Distributed Art and the Creative Technologist

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Introduction

Over the course of the 20th Century, media technologies increasingly became the conduit through which culture was accessed. Radio, television and film supplanted the town square, the gallery and even the casual street-side conversation as the dominant pathways for an individual to experience his or her world and community. Artists, as creators, editors and mediators of culture, paralleled this transition from physical to virtual experience, moving from object-based works to idea-based works. Unfortunately, while this shift to the conceptual appeared to be an opportunity to break free of the insulated and exclusive gallery environment, mainstream culture was extremely resistant to the influence of the avant-garde, either absorbing or deflecting outside attempts at manipulating the mass media. However, with the ascendancy of online culture in the 21st Century, the foundation of virtual experience has been profoundly changed; one-way communication systems controlled by the very few are rapidly being replaced by a distributed web of content that can be infinitely expanded and altered by users themselves. In this environment built from code and mediated by a screen, individuals with a background in both the visual arts and the programming arts have an opportunity to directly modify the architecture of culture rather than simply repackage and react to the culture. It is within this conjunction of the creative and the technical that I would like to position my recent work.
The Creative Technologist

“Creative Technologist” is a relatively new term and is a label most often self-applied to designer/developers who are skilled in the creation of interactive websites and utilize software technologies such as Adobe Flash. I would like to adopt and somewhat redefine this label to encompass the artist who not only works in the digital realm but has a practice built through a deep understanding of the underlying structures and systems of the digital society.

In the past, creative persons have frequently held the position of outsider or bomb-thrower, vaulting their alternate view of the status quo into the cultural mix, hoping that their ideas will catch hold and produce change, and some do succeed in this goal but usually over the course of decades, not days. Modern artists have often acted as canaries in a coalmine, presaging broader cultural battles within their work but have also increasingly found their message ignored by the mainstream. In the current cultural climate where our world is being mediated by an overwhelming, uncontrollable and visual system, creative individuals have an opening, an opportunity to work within and alter the mainstream itself. The high school student with social networking and computer skills can plant the seeds for a community just as strong and vibrant as one implemented by the Sony Corporation. The Web is a leveling force; while it is true that the Web allows for a completely amoral and non-objective blogger to speak to an audience the same size as that of a professional journalist from the New York Times, it also provides an opportunity for a group of objective and idealistic individuals to challenge the possible bias of a corporate or governmental mouthpiece. The skills of an artist, such as hyper-awareness of a society's strengths and weaknesses, the creation of community, and the ability to reduce conflict and other abstract concepts into a comprehensible package for an audience, can be focused with a set of technical skills to provide a direct pathway for previously underground ideas to be brought into
the mainstream. It is in this respect that I use the term creative technologist, defining an artistic individual who not only uses but also creates and manipulates distributed systems in order to bring social change within his or her extended virtual community. The democratizing process that has manifested itself through distributed computing, distributed knowledge, distributed media and distributed culture is a force that will also have an effect on the arts, and it is this question: "What is distributed art?" that drives my creative process. How will this democratization of cultural production alter the creative process? The creative technologist's role is not that of a singular creator of a work but that of an initiator or enabler, someone who carefully plants the seed of an idea or community and allows it to grow out of their control within ever-expanding global networks.

Arguably the momentum within the art world over the course of the past 150 years has been towards an elimination of technique, a steady removal of the traditional skills of the artist as craftsman to the point where the artist is completely unmoored from the restrictions of the physical world and deals purely in ideas. Within this frame of reference, putting forth the proposal that a contemporary artist must have a technical understanding of the inner workings of the digital environment would seem to be a regressive stance, an emphasis on making rather than on the conceptual. However, this position is based on the assumption that programming is a mechanical task, a simple process that is merely an extension of the cold logic of a computer. Ask any hacker how he or she learned to code and they will inevitably say by taking bits and pieces from others, reassembling them, reconfiguring them, and slowly developing their own style, a process akin to the maturation of a traditional artist. Ask him or her about their opinions on the ownership of ideas and they will state that information is meant to flow freely and should not restricted by corporate or governmental forces, a position identical to many contemporary
artists. Even the social engineering methods that mischievous hackers use manipulate individuals into giving them access to confidential information parallel the work of artists such as The Yes Men, who under false pretenses infiltrate the exclusive institutions of the powerful in order to promote an alternative, often suppressed agenda. Hackers are little gods, trying to define and control virtual worlds that are idealistic re-imaginings of the real world, a description that could just as easily be applied to artists. Regardless of whether or not one buys into the idea that programming can be an art, one cannot deny that code is no longer being used to simply perform monumental accounting tasks but to filter the way we interact with each other and our world. The ideals and creativity of the people building these gateways have a direct influence on their form. As a result, the hacker or open-source philosophy has as much or more of an effect on the structure of contemporary culture as the traditional arts have, and it would benefit the culture as a whole if both parties were aware of their mutual goals and ideals and used the strengths of both approaches towards the improvement of that culture.

Within this document I will argue that many of the hallmarks of conceptual art, such as appropriation, social engineering, and an increased responsibility on the viewer to complete a work, are also present within the hacker culture that gave birth to the online world, and I believe the two disciplines should not be viewed as separate and incompatible but parallel in development, with similar goals. In the present environment, individuals who are well-versed in both areas have a unique opportunity to actively and directly influence mainstream culture.
The Path to Distributed Art

The term distributed art is derived from the computer science concept of distributed computing. Distributed computing, also known as parallel computing, is defined as multiple independent computers operating over a network to accomplish a common objective or task. At its most basic, distributed computing is a method of atomizing and spreading the labor required to solve a problem across a number of processors, using the power of multiple computers to solve portions of a problem that is too large for a single computer to efficiently tackle. A well-known implementation of this concept is SETI@home, a small program installed by hundreds of thousands of computer users that downloads small parcels of data captured by radio telescopes pointed into space, analyzes these small parcels while a computer is idle (much in the same way a screen saver operates) and then sends the processed data back to a central server and collects a new parcel for processing. Processing all of the radio data collected by SETI on a single supercomputer would take years and a huge outlay of money, but by spreading the task out across a network of users and capitalizing on the huge amount of downtime most personal computers have, a monumental task is made manageable. An even more ubiquitous example of distributed computing is the World Wide Web itself. The Web is not a centralized system based around one central computer and database but a collection of nodes that is ever increasing and theoretically infinite in terms of expansion. When one adds a server or website to the Internet, the system expands, the amount of knowledge expands and the number of pathways to other nodes expands. It is not a singular system but a modular one capable of continuous growth.

This idea of distributing computing power across a network through an ever-expanding number of nodes soon moved out from the technical realm to the greater sphere of knowledge itself. A familiar example of this transfer is Wikipedia. Instead of relying on a small number of
editors in the way a traditional print encyclopedia would, Wikipedia opens the editorial process to everyone who has access to the site, allowing for tens or hundreds or thousands of individuals to work together and contribute to an entry. The underlying theory of Wikipedia is that 1000 editors with a deep, specific knowledge are more accurate and more efficient than 1 or 2 editors who may have a wide, general knowledge of many topics. Another system that illustrates the concept of distributed knowledge and one that is less controversial than Wikipedia is del.icio.us, a social bookmarking tool. del.icio.us provides an interface for users to tag web pages with one-word descriptions of their content, allowing users to organize and retrieve sites at a later time according to their tags. In addition, these tags are shared among all users of del.icio.us, which creates a folksonomy; a pool or cloud of tags that provides an index of the Web itself; one could search for pages tagged with "linux" or "css" and browse the sites that other users have marked. The scale of the Web makes it impossible for one or even a crew of 100 persons to index it fully, but an index built in the same way the Web itself is built, through focused, collective labor combined via a network, creates a product that is greater than its individual parts.

This idea of harnessing the small efforts of many towards a (perhaps unconscious) common goal rather than the monumental effort of a few has also spread into the discipline of software development. In the past individuals would labor to create a chunk of code and then sell the results to the rest of the computing community. When systems became more complex and the programs they ran became larger and more expansive, corporations would gather groups of programmers together to complete a software project that would then be sold to the community. However, in recent years the concept of open-source software has taken hold. Code created by a group of one-hundred programmers under the guidance of a corporation most often falls victim to the bureaucracy of said corporation; a group of one-hundred is not necessarily ten
times more efficient as a group of ten or able to create code ten times more complex. In the corporate world there are layers of management to deal with and goals that are based on increasing profit and market share rather than based on creating the best software solution for the problem at hand. The open-source movement espouses the distributed labor model similar to that of an ant colony. All the workers are focused on a singular goal (the best software possible); they voluntarily devote their time to the project; they have a personal investment in the specific component they are coding; they are most likely working in conjunction with others who are just as devoted and just as focused; and collectively the participants' efforts create and refine a product which can in some cases be infinitely better than their corporate peers’ output.

It is within the open-source community that distributed computing moves from simply being a technical process for problem solving to becoming a philosophy that can be expanded beyond technology into a community and culture. The sub-culture of open-source computing has an underlying belief that the hive mind, the small efforts of the many, is vastly superior to the mind of the individual; a belief tied to the idea that a single supercomputer cannot compete with the processing power of hundreds of thousands of personal computers harnessed to work towards a singular goal. The expansion of the open-source model outside of computer programming can be seen in the example of OpenCola, a complete soft drink recipe that has been posted online as an alternative to Coca-Cola or Pepsi. Whereas Coca-Cola's formula is a closely guarded secret that must be preserved in order for an enormous, international economic force to maintain its dominance, OpenCola is a publicly available formula that can be altered and improved upon by anyone. OpenCola is a sociopolitical response to the monolithic corporate rulers of our society; it is a protest of the world of the protected, copy-written, patented idea; it is an alternative to a world where progress and culture are owned by singular entities. OpenCola and the open-source
movement position themselves as a truly democratic alternative to the multinational corporate
oligarchy that currently dominates our planet. And while in the past such democratic ideals have
been put forth (most visibly in the cultural upheaval of the 1960’s) they have always been painted
as utopian and outside the mainstream. With the increasing prevalence of the Web as the
mediator of culture, these ideals are becoming the mainstream. The dominant systems of
communication based on media controlled by large governmental or corporate organizations are
being challenged by a medium that is built on the very ideas of open-source or distributed
culture: the World Wide Web. And while these centralized forces may attempt to co-opt parts of
this democratic system, they will be unable to fully absorb the system and place it under their
control. Some may believe that the open-source solution is a utopian ideal, one that will finally
bring true democracy to human culture; this is of course, not true. But in the same way that the
democracy of the 20th century was an improvement on the democracy of the 19th and 18th
centuries and the social systems of the recent past are more just than those of 500 years ago, an
open-source society is closer to the democratic ideal than the corporate dominated society of the
late 20th century.

Evidence of this move from the dominance of singular cultural forces to more democratic
forces can be seen in the recent explosion in distributed media. The prevalence of the Web has
given individuals the ability to create their own media channels as an alternative to corporate
media channels. Blogs have become a counterpart to mainstream journalism, pod- and
vodcasting parallel television and radio; even BitTorrent (a system of spreading high capacity
content across many users’ machines) reduces the dependence on centralized resources to house
media. It is obvious that the culture of the haves is moving more and more towards the realm of
the networked computer and away from the realm of corporate networks, and artists, as
participants, creators and critics of this culture, must be a part of this move towards an open-source society. What specifically are the skills artists possess that can be utilized towards this goal?

**Building Community**

Artists do not exist in a vacuum; they are constantly reacting to and attempting to interact with the world in which they live in. The artist's role within the world can be that of enabler, giving those who have difficulty understanding or transmitting an emotional response to their environment a pathway in which to express themselves. The Vietnam Veteran's Memorial is a prime example of what I consider to be a profoundly successful work of art. During the time of the design's selection the work was divisive. There were those who felt it was a fitting tribute and others who felt it was an affront to veterans. But this conflict was not truly about the monument itself; it was about the conflict that still existed within the United States over the Vietnam War. In the late 1970s and early 1980's the issues surrounding the war had not be resolved or even spoken about. The memorial, even before its physical construction, provided a stage for Americans to fight, argue, and run through the complex emotional scars the war had carved in the American psyche. Once it was built, the memorial became a physical locus of the nation's collective experience. Individuals on both sides of the rift could come to this place and find a common bond, that of loss and of wanting to find resolution. The work became part of the healing process, perhaps even an essential step in that process; it is evidence that a creative work can have a profound effect outside of the exclusive realm of the arts.

Rebels, individuals, artists, and outsiders who want to create a better world have an idealistic view of how humanity can be improved and they set out to create a haven, a laboratory
in which to experiment with these ideas. Whether it is a town, commune, art collective, religion or cult, they all fall under a singular definition: community. But the creation of community is an amazingly difficult process; there are economic, political, and geographic barriers that constantly conspire against new ideals. For every successful country, town, commune, band, or religion, there exist thousands of failed social experiments, collapsed under their own weight or external forces. But the arrival of virtual communities lowers the outlay of capital needed to attempt these experiments. Where once an individual would have to be within physical proximity to join others who had similar ideas, now the Internet provides pathways for connection between those who are physically isolated from each other. Where once there might have been an isolated pocket of rebels/individualists/outsiders/free thinkers/artists in a town who were unable to easily find others of the same mindset unless they moved to larger, more diverse cities, isolated individuals are now able to connect to peers all across the world and form a large, city-sized community online, free from the physical and economic restrictions that once existed. In addition, the creation of online communities is a flexible, easily modified process. If one community fails to take hold and survive, it can be tweaked, reformed or built upon to create another, better version. This type of evolution is seen in commercial social networking sites; MySpace was not the original social networking site, it was a community built from the example of other sites that had worked or failed to varying degrees.

In much the same way Maya Lin was able to create a place for shared experience, the creative technologist can seek to build online environments that bring individuals together, provide a common space for creative collaboration, and perhaps even inspire change within those who gather together. The online world is a completely customizable platform for building community and reality itself. Instead of throwing bombs from outside the village wall hoping
that someone notices their dissent, artists can move themselves into a position where they are building the villages themselves. Artists develop the skills of building and filtering experience, and the Web is a free environment in which to build experience. It is the role of the creative technologist to exploit the opportunity this technology provides in which to shape and improve our communal experiences. For if those with idealistic motivations do not take up the challenge, those with purely commercial and self-serving motives will define the online experience and therefore define the life experience itself.

**Becher -> Flickr -> Bechr**

Consider the work of Bernd and Hilla Becher: it is systematic, structured and represents intense focus and discipline. If viewed individually, their photographs display great technical and compositional mastery but very little context and content; a single image could easily be mistaken for a manufacturer's documentation of a construction project. But when viewed as part of a collection, or one fragment of a 40+ year typological study, the power of the work is revealed. It is a body of work that encompasses documentary, design and the conceptual. The viewer is forced to reconsider the mundane, to see objects once considered non-distinct as possessing individual character. These collections reveal an unintentional beauty, one that is generated not by the creator of the object but by the observer/mediators who reposition the objects (water towers) via technology (photography) creating a new perspective for the viewer.

Now consider the photo sharing site Flickr with its system of collaborative tagging. One can easily do a search for photos tagged with "water tower" and instantly gather a collection of industrial images that would take the Bechers years to compile. The current technology is able perform a previously monumental task in mere seconds. But rather than diminishing the
achievements of the Bechers, this fact increases emphasis on what is truly valuable and unique in their work. By removing the superficial focus on the sheer amount of labor put into the couple's work, we are allowed to see the underlying core. When we look at the Flickr water towers, we see a range of images, some beautiful, some not; as a whole the collection is too varied, we have no anchor except for the search term "water tower" to link these images. It is a subset of the anarchy of image we experience in everyday life. An artist's role, like that of the Bechers, is not only to collect but to arrange and arrange in a way that takes us out of everyday experience and apply a new perspective on the everyday. One might say that this is an argument against distributed media; the Bechers' now antiquated method of data collection by one or two individuals is a much more effective artistic model than the anarchic collection represented by Flickr. However, the core talent of the Bechers is not their ability to stay focused on a narrow subject but how they arrange that subject. The lesson gained should be that the contemporary artist, when presented with this technology for expansive and collaborative data collection should use their skills to filter and arrange this mass of unfocused material for others. In the same way the Bechers use the camera to frame an object and their visual skills to arrange their documents of objects, the creative technologist should use code to filter and arrange the pool of content generated by collaborative environments.

**Warhol as Blogger**

Warhol's well-worn quote: "In the future everyone will be world-famous for 15 minutes" has been endlessly invoked to describe the burgeoning blogosphere, but it is not just Warhol's foresight/prescience that makes his work/life worth exploring in the context of online culture, it is his obsessive documentation of his own life/milieu through photography, film, audio, diary
keeping, and "time capsules" that provides a model for the present-day wired individual.

Warhol's unique position within American culture as an artist and celebrity allowed him the financial base on which to pursue what was at the time very expensive micro-documentation of his world through thousands of Polaroid photographs and cassette recordings; at one point in his life Warhol was carrying a tape recorder with him at all times, documenting every conversation he had. Much of Warhol's work can be oversimplified conceptually as elevating the everyday/mundane to the level fine art or, conversely, as lowering fine art down to the level of mass produced commodity. This perspective bleeds into his exercises in self-documentation. Through technology (and privilege) he created an excessive dilution of the concept of the artist as mediator and editor; instead of filtering content he began to accumulate as much content as possible, becoming somewhat of an automated pipeline. His series of time capsules, dated cardboard box repositories of the various ephemera collected during the course of daily activities, are a case in point. What would be considered the detritus of a pack rat if discovered after the death of an anonymous individual becomes priceless because it is the remnants of a famous individual's everyday life. By merely touching and storing these bits and pieces, Warhol increased their value and as a result left those who inherited these works the monumental task of inventoried their contents. And again this elevation of the mundane calls into question the role of the artist himself and the position he holds within society. Warhol's film *Sleep* brings these ideas to an extreme. Typically, filmic works rely on editing to compress time and shape perception to force the viewer to experience a sculpted version of reality; as with any art form it is often used to alter or create a new perspective in the viewer. *Sleep*, however, is completely literal; an eight-hour film of someone sleeping for eight hours, there is no modification of the experience (except by the framing of the device used to capture the document). It is an analogue
to sitting in a chair and watching someone across the room as they sleep for eight hours; something one would not normally do because of the complete lack of engagement. However, with Warhol's stamp we are asked to tolerate an extremely boring experience. The film immediately calls into question that choice: how far are we willing to go to accept the artist's authority and role as mediator?

How does this connect to the blogosphere? With the lowering of restrictions on access to the distribution networks of cultural capital there is an exponential amount of content that is flooding our world. In the way that Warhol's pseudo-mechanical accumulation of mundane events and objects called into question the artist's position as arbiter of quality and value, so too is the role of the creator being called into question by the dilution that has occurred now that millions of individuals are able to flood the culture pool. In the past, revered artists did not become who they were by mere talent alone but through a complex process of social engineering and financial opportunity which allowed them to be placed before the public for consumption; for every Warhol there are thousands of other creators who are unable to navigate the system and achieve economic sustainability as an artist. Now everyone can place his or her work before the eyes of the world via the Web, and this pool calls into question the role of any creative individual. Are you a writer if you say you are a writer or if you are paid to be a writer? Or is it if other writers think you are a writer? And it is entirely possible that if one could eliminate all of the "bad" writers in the online world, those that are left with some intrinsic value and talent could still number in the hundreds of thousands, and that cloud of talent would be completely un navigable.

In the past there were gallery owners, media owners, and others who filtered the content everyday people were allowed to access and choose from. Now these filters are disappearing.
There is no true authority (whether valid or not) that culls the 99% of cultural content created that we have no need for. The cultural spam filters are breaking down in the face of an overwhelming amount of creative noise. The dichotomy of the elevation of the mundane with the degradation of art calls into question the very idea of art and the artist; a question that has been haunting artists since the beginning of the 20th century: "Am I relevant?" "Do I have a value besides that of pure commodity within a culture?" Is the modern day artist nothing but a charlatan or simple arbiter of taste? An artist who collects enough cultural capital so that whatever they bless suddenly gains value is no longer a craftsman but merely a figure of authority in which we put faith, much as we put faith in a government that issues currency. We put faith in the established artist and the established art world, letting them determine what is valuable and what is not.

Technology usurped the role of the skilled artist as documentarian (photography, film and video replacing portraiture and realistic depictions of our world through artistic rendering) and now technology is usurping the role of the artist as arbiter of quality. The creative individual can no longer be effective in the role of individual creation and in addition can no longer be effective as a vehicle for conceptual analysis of the role of artist itself. They must become sculptors of the greater reality and experience. Instead of creating singular work that alters the perceptions of the individuals that happen to encounter the work, they have the tools and opportunity to alter the very structure of experience through the technology that mediates our view of the world.
Relational Aesthetics and Web-based Experience

Nicolas Bourriaud's effort to collect the emerging trends within the art world of the 1990's under the definition of Relational Aesthetics deals exclusively with artists who work within the "real world" i.e. galleries or public spaces. However, many of his observations and the challenges to those observations provide a bridge from conceptual artistic practices of the late 20th Century to the development of Web-based experiences in the 21st Century. Bourriaud describes works that fall under the mantle of Relational Aesthetics as:

"involv[ing] methods of social exchanges, interactivity with the viewer within the aesthetic experience being offered to him/her, and the various communications processes, in their tangible dimension as tools serving to link individuals and human groups together." (Bourriaud, p. 43)

An example of this approach would be the work of Rirkrit Tiravanija that often involves the creation of a social space within a gallery, such as a cafe where food is cooked, served and consumed, where visitors engage with the artist and each other to complete the work. Criticism of Relational Aesthetics often centers on whether or not the movement towards social interactions as the basis for artwork is actually a new trend and whether or not simply making a work open to participation automatically represents a democratic idealism. Joe Scanlan has called Relational Aesthetics boring and a rehash of 1960's Fluxus happenings without any of the danger of those events. Claire Bishop questions Bourriaud's claim of political substance within social art because it does not take into account the quality of the relationships created; Bourriaud seems to believe that if a work is participatory and open ended, that makes it democratic and is therefore "good." But democracy is not simply a free and open arena; it is an organic collaboration built from friction and conflict and it is hard to see where the great changes generated by a vital democracy or a vital work of art exist in events that merely collect people together for a familiar social transaction in an unfamiliar context. The greatest flaw within
works of this type are their dependence on the established art community; even social artwork that takes place outside of the gallery in the community at large is still reliant on a network of artists and critics (people in the know) to support and define its value. Such work becomes an extension of the closed social network of the fine arts rather than an incursion of the arts into everyday life.

However valid these critiques of Relational Aesthetics may be, they do not completely invalidate the concept; they point out gaps in the initial proposition that can be addressed through adjustment of Bourriaud's approach. Social interaction is an acceptable material for the creation of artwork and this is definitely not an idea that came about only in the last decade; one could argue that all art is social interaction and the genesis of participatory and performance art in the 1960's and 1970's was simply a shedding of the physical component of such interactions; an acceptance that the object was a placeholder or focus for the art but not the art in and of itself. One can then easily transfer these conditions to the Web; a place built on social exchanges that link individuals and groups together but lacking the physical component of place found in locations such as the town square or art gallery. In contrast to works that fall into the traditional definition of Relational Aesthetics, Web-based environments are free of the boundaries formed by the established art community. But in much the same way that Bourriaud accepts social art as a grand political gesture without any consideration of the quality of the relationships produced, many tech-based idealists view the Web as a fully realized democratic utopia where all participants are equal and the power structures built by corporate and governmental forces are easily circumvented. But freedom (or anarchy) is not enough; this open environment must be focused in some way in order to have a beneficial effect on human experience. This is where an artist with an understanding of technology can be of great use; for without the critical and
Exploring the Concepts of Distributed Art

Eggpass (2004 w/ Rose Marshack) was initially inspired by Stanley Milgram's work on
the so-called Small World Problem. But while Milgram’s research involved sending a package to a specific recipient through personal connections in order to determine the average number of links between two strangers, Eggpass was designed to be an open-ended trace of personal connections that would, over time, generate a complex map of social networks. One dozen hand-sculpted eggs were imprinted with the URL eggpass.org and a unique identifying number. The eggs were distributed simultaneously to twelve individuals along with a simple set of instructions: pass the egg to someone with whom you are on a first-name basis; please explain these rules to to them; please visit eggpass.org and answer a few questions. The Web component of Eggpass prompts visitors to submit the number of their egg, location of the egg, who they received the egg from, a photo of themselves or the egg, their name and email (optional), and any comments they have about the transaction. This information is then displayed on the website in 12 columns ordered chronologically, each corresponding to an egg, in which viewers can chart the progress of an egg as it is passed from person to person.

There have been other online projects involving the release and tracking of objects such as: phototag.org (disposable cameras passed from user to user); bookcrossing.com (books left in public places for potential readers to discover); and wheresgeorge.com (dollar bills tracked by serial number). However, all of these projects involve transactions between strangers and have a tendency towards anonymity and limited response. Eggpass was designed with the hope that by initiating a series of transactions through friends, participation would increase due to the "friend of a friend aura" similar to that of social networking sites such as Friendster, MySpace and Facebook. There is also no additional effort involved besides the social exchange of instructions, no books to read, no purchases to be made and the risk of dead ends are reduced because there are no uncomfortable moments spent trying to convince a stranger to take an object from a
stranger.

The physical component of Eggpass was chosen and designed with attention not only to portability but also to the suitability of the object within the parameters of the work. Having an object as the centerpiece of the project was essential, our desire was to join the physical realm to the virtual, to merge the intimacy of face-to-face communication with the borderless expanse of online communication. An object linked to the Web bridges the gap that modern residents of virtual worlds have between their physical contacts and their virtual environment. In addition, the work can survive outside the Web (which although it may seem ubiquitous, it is not); an egg could be passed without being documented on eggpass.org and resurface years later when someone who may not even know the origins of their egg checks the website and reinstates contact. The shape of an egg was chosen not only for its familiarity and comfort in the hand but also for its symbolic form, as that of an initiator, a representation of genesis. The eggs in Eggpass are the seeds, created by the artists, which are planted in a network and from which the artwork grows, uncontrolled by the hands of the artists. The eggs were built as valued objects but not valuable objects. They have weight and a black matte, hand-formed surface but are not of a precious material; the formal text on the surface gives them an official air. People who encounter the eggs in the wild will (it is hoped) instinctively realize that the effort behind their construction is of a personal, creative nature (i.e. not part of a mass marketing effort) but not become so attached to the eggs that they wish to keep them in their possession permanently.

After almost three years of traveling the eggs did take on a life of their own, guided by those who encountered the eggs. There seemed to be an assumption by participants that the eggs should be passed over great distances, exactly the opposite of the short, quick passes the creators expected. Eggs would go undocumented for months and then appear on a different continent.
Eggs traveled from their home base in Champaign, Illinois USA to distant locations in Brazil, Greece, China, Morocco, and Australia. An egg was intentionally passed to a relative of one of the creators in the hopes that it would be returned to its home only to be diverted from that goal by another participant. The submission forms became miniature platforms for expression with participants writing elaborate descriptions of their encounters with the egg and posting creative photos and short films of the eggs. One particularly impressive submission contained an animated GIF of the egg traveling throughout London being compared to various egg-shaped sculptures and buildings. It was these unintended creative tangents to the original intent of the work that became some of the most interesting aspects of Eggpass. A simple set of rules and a collection of objects created a micro-community that connected individuals who were separated geographically and allowed participants to contribute to and expand on a creative work. Eggpass grew from the work of 2 artists into the work of 66 (and counting) artists. These results inspired further explorations in the creation of simple, computer-based environments that participants could creatively use and abuse.

*ChainMail* and *Echo Wall* are two projects which subvert commonplace online models, email in the former and chatrooms in the latter, with the hope of exposing a new perspective on these environments for the user and to perhaps inspire creative abuse of the systems.
ChainMail (2005) reverses the email process with an interface that takes a user's email address and a short message and transfers their message upon submission to the previous user of ChainMail, and in time, the user receives a message from the next participant. The result is a series of reverse communications with participants sending a message to and receiving a message from a stranger. The interface was designed to be reminiscent of Gmail in order to simultaneously create an impression oftrust and a questioning of that trust. ChainMail forces the user to think about the online communication process, making them mentally trace out the pattern of emails that will be sent, and with the reversal of the typical process, the presence of a middleman (in this case the artist) is revealed. Obviously an email that is sent through ChainMail must be saved until another communication is put into the pipeline, pushing the
currently held message out to the waiting recipient. In traditional email communication, we view
the process as direct, ignoring the numerous filters between sender and recipient (computer, mail
server, etc.) but *ChainMail* subtly reveals the components we choose to ignore in everyday
online communication. However, the revelation of this intermediary technology does not impart
a de-humanizing effect on the transmissions sent through it, in fact the results seem to indicate
the opposite effect. While often technology is criticized for causing a reduction in human
contact and increased isolation, the *ChainMail* communications were predominantly of an
empathic nature, with messages expressing hope and optimism and well-intentioned advice for
the recipient. Anonymous communication is often seen as an opportunity to express the crudest
aspects of our nature; one needs only to look at the example of graffiti in a bathroom stall to see
this in action. Yet the users of *ChainMail* found their anonymity to be an opportunity to make a
positive, personal connection to a stranger; perhaps because such opportunities are becoming less
and less frequent in a world dominated by technology or perhaps because of the implied golden
rule embedded within the interface, one sends the type of message they would want to receive.
*ChainMail* reveals the ability of technology to be the foundation for emotional and
transformative interactions between individuals.
Echo Wall (2005) is a web application that allows users to chat across time. The user submits a short message, the message appears center screen, and over the course of an hour, moves off-screen at an angle corresponding to the second it was submitted (0:15 moves to the right, 0:30 moves downward, etc.) Messages reappear at the same time over the next week, following their original path across the screen but with progressively decreased opacity (the words fade over a week). Additionally, the posting cycle repeats on a yearly basis. This creates an environment where users can respond to messages from the present and the past. The online
world is often experienced in the moment, full of instantaneous communications and postings that quickly fall by the wayside and are replaced by the latest news and gossip. *EchoWall* is an attempt to bring an awareness of time and history into this ephemeral space. The digitization of information allows for the storage of vast amounts of communication but there are very few opportunities to stumble upon archived information if it is not searched for directly. In much the same way a public wall can be filled with graffiti and layers of information over time, *Echo Wall* contains layers of information that are covered and uncovered through methods uncontrollable by the user. Conversations can occur over the course of days or years rather than just in the moment and are not dependent on two persons occupying the interface simultaneously. *Echo Wall* builds a permanent mental space for its users by incorporating the concepts of time and decay in an environment that all too often diminishes context and permanence. Again, it is not technology that isolates the user from an experience as complex as that found within the physical realm but the ineffective implementation of such technology that opens the virtual experience to criticisms of superficiality. It is the role of the creative technologist to find the deeper channels of communication available within a system.
Branches (2006-07) is the culmination of these explorations of seeding, structure and control within the realm of Distributed Art. Obviously collaborative art is as old as creativity itself; people have been working together building and documenting their culture since the beginning of civilization, but as technology modifies a culture it modifies methods of collaboration. A well-known precursor to present-day collaborative systems would be the Surrealist game Exquisite Corpse, where multiple participants sequentially add lines of text or parts of an image to a work without a complete view of others' contributions. An example of this type of sequential development in the digital environment would be Photoshop Tennis, where a
seed image is posted online, a participant downloads the image, makes a modification, reposts the image, and another participant then makes a modification; the process continues until interest in the thread wanes. Without the Surrealist touch of "blindfolding" the contributor, the results are less disjoint and fantastic and are more akin to the child's game of telephone where a word or phrase slowly mutates into a completely different form. Photoshop Tennis "matches" can contain the humor of Surrealism but they lack the depth of their 20th Century precursor because the surprises and unexpected turns come from intentional actions of the participants rather than any embedded randomness in the system. The results are merely a display of various individuals’ technical virtuosity rather than an insight into the subliminal threads that connect the participants. An online project that does tap into the collective consciousness of its participants is SwarmSketch (www.swarmsketch.com). Users are allowed to add a 100-pixel line to a page with a specific topic, for example, "Cicada", and then have the ability to vote on whether or not other lines that have been added should remain in the drawing. Over time a childlike series of scribbles will (usually) form into a primitive representation of the topic. The problem with this approach connects back to the criticisms of Bourriaud's Relational Aesthetics; the resulting work is somewhat mundane (for example, the aforementioned topic Cicada unsurprisingly generated a drawing of a bug); it is a curiosity but is not something that a viewer or participant would engage with and draw inspiration from. Whereas the Surrealist experiments follow a revelatory path by relinquishing a certain amount of control to the subconscious, the online experiments simply embrace the ideal of free collaboration and do little to focus the process in any constructive way. The goal of Branches was to create an online environment where there is enough structure so that an inherent beauty is formed from the anarchy of collaboration but without so much restriction that participation and creativity are stifled.
The *Branches* application begins with a set of eight seeds, a collection of short sound bites with associated images in a pool. A participant is allowed to choose which sound bite/image they would like to replace. They are then prompted to upload or record a sound bite and image of their own. Once their contribution has been added to the pool, the participant uses the sound/image blocks in the pool to build a short musical and visual sequence on a grid. Upon completion, the sequence is submitted and added to the existing string of sequences created by previous participants. A user can play the series of sequences to see and hear the resultant images and soundtrack which demonstrate the evolution of the ongoing collaboration. Certain images and sounds survive for long periods while others fall away quickly; some sequences follow visual patterns while others follow musical patterns. A balance is achieved by allowing individual contributions to the pool but restricting the influence of a single user onto only one-eighth of the basic building blocks of a sequence. Requirements for technical ability are also reduced. An experienced musician or visual artist can manipulate the tool and achieve interesting results but so can a novice in either area. The system allows for guided play and room for abuse. Participants generate music, visuals and a map of their collaborations all from a set of limited tools and rules. It is within this grey area of restriction and permission that the art of the creative technologist is found. It is a blend of technical skill, environment building and knowledge of human behavior that must be carefully constructed to create a sort of virtual organism that will grow and expand on its own once released into the wilds of the Web. The role of the creative technologist is more akin to the role of architect than that of painter or sculptor but in all these disciplines there is a common thread, the filtering and focusing of human experience.
The Downside of Digital Culture

Digital technology has given present day society the ability to preserve exponentially greater volumes of information compared to the analog methods used by previous generations. The Oxford English Dictionary, once only available as a 20-volume set of books weighing in at 150 pounds, is now available as a single compact disc or as pure data accessible via a web server. However, this transition into the digital realm has also marked a shift from physical forms of documentation to more volatile methods of preservation. Where once there were objects such as books and paintings that could survive for years with simple maintenance, now there are ones and zeros which require a complex, delicate array of technologies to remain intact. Hundreds of years from now it will be more likely that our ancestors will be able to read the label we have placed on the surface of a compact disc than be able to see the photographs we have digitally encoded on that disc. Additionally, even if our digital culture can be archived over generations, this culture has created a massive amount of data to wade through. In the past, media gatekeepers filtered content at the source; subjectively determining what should be preserved and what should be discarded. With the increased democratization of communications, there is an ever growing, unmediated density of content that is becoming more and more difficult to navigate and interpret. There is a limit to how much information an individual and a society can ingest; there will always be some form of reduction involved in the process of defining an era but how this reduction will occur within the digital realm is as much determined by the technology itself as by dominant social forces. Traditionally the digital artist has been defined as one who creates work within the digital realm but I believe this definition can be expanded to one who analyzes, emphasizes and reveals the inherent conflicts that arise from our culture's transfer from direct to coded methods of documentation regardless of the tools or materials used.
One of the great advantages of digital technology is the ability to store massive amounts of information in a small space. The "Soul Catcher," a theoretical device that records every moment of one's life, is an extreme example of how digital technology could be used to document reality. With the increasing miniaturization of electronics and the decreasing cost of high capacity storage media, such a mechanism is no longer in the realm of science fiction but is an inevitability. My work *Waking Hours* (2004) was inspired by this prospect. The piece began with a process of data collection: over the course of a year, I photographed my environment every hour I was awake. Only a few years ago such an endeavor would have been highly disruptive and prohibitively expensive for most individuals to complete, but with a small, portable digital camera, each photo required only a momentary series of gestures (remove camera from pocket, point, shoot, place camera back in pocket) and the resulting 6000+ images were economically stored on a compact flash card and hard drive. This is in contrast to the 200
rolls of film that would have had to have been purchased and developed if an analog camera had been used. Once the year was complete, I digitally arranged the photographs so that each day was represented by a column of 24 images with black placeholders for the hours in which I slept. On a computer, this collection could be viewed as a whole, revealing patterns that occurred over days or months, or individual images could be zoomed in to, revealing the content of a specific moment. However, this format didn't really give a sense of the scale of the project. The computer screen has a way of compressing the scope of everything within it. A whole year is viewed at the same size as a single day. In addition, I began to worry about the volatility of the digital composition of the piece. What if my hard drive crashes and I lose all the photos? What if my CD-R backups get damaged? Will I even be able to view this work on a computer twenty years from now? A physical version of the work would at least have the guarantee of visibility over time, barring any decay or damage, which the digital version is also susceptible to. By printing the piece as a 40 foot banner, it was not only preserved physically but viewers were able to see the work as a whole from a distance, which gave them a sense of scale, and up close, which gave them access to individual moments. While the reaction of others to the work is interesting (most people gravitate towards the black bands across the banner that correspond to my erratic sleeping patterns), it is my own relationship to the piece that raised many questions about the value of pervasive documentation. My son was conceived and born within the scope of the project; I watched 15 films in 4 days at Ebertfest; my father retired; I earned my bachelor's degree. These were all moments that could be easily found within the grid: an early morning drive to the hospital followed by weeks of patchy sleep; a block of dim photos of a movie screen; a party bracketed by images of the highways to and from Chicago; a series of all-nighters in front of books and computers. There were also less specific elements of my life that emerged from the document: I vaguely knew I spent a lot of time staring at a computer screen but here was
concrete evidence that I spent a majority of my life that way. Family photos and home movies are inherently fictional creations; for the most part they serve as idealizations of our life rather than documents of reality. Human memory works in much the same way. We selectively build a narrative from the bits and pieces we choose to save (remember) and leave out (forget), our memories are not a true version of events but a mythology that we've created for ourselves. By imposing an hourly structure on documentation, the personal bias that is inherent in memory is challenged. Granted, in the *Waking Hours* project I still had control over what was being preserved but that control was not as strict as that which is found within a family photo album. While the memories I have of specific moments within the year I documented are still held in my mind, they also exist externally as images that color and enhance my recall of those events. An old photograph of a moment that we have forgotten becomes a memory when we see the image: I do not remember sitting on a couch with my grandfather when I was two years old but upon seeing a snapshot of that moment, it becomes real. There is no way I can remember every hour of my life for a year but with every hour preserved externally, I have access to the mundane and uneventful and possibly painful moments that fill the space between the four or five events that I have chosen to save from the year. When documentation is expanded to capture every second of a year or a life, what will be our relationship to this information? Will we record the first thirty years of our lives and spend the next thirty reviewing the footage? Will we be better off having a factual account of our lives rather than the selective recall of the past we have now? Would such a document be a tool for settling arguments or a generator for increasingly contentious personal conflicts?
24 Hour Walk: My Block - Equal Day and Night - March 17, 2007 (2007) is a digital video-based document of a walk conducted every hour, for 24 hours, around the block on which I live. The twenty-four synchronized videos are projected on a four-walled column that allows viewers to echo the circular walks captured on video and to echo the daily cycle of the planet earth. The piece has an obvious antecedent in Waking Hours but rather than creating a record of hourly experience with a greater resolution than human memory, 24 Hour Walk reduces the resolution by encouraging direct comparison of each hour to the others and as a result, the basic, contrasting elements between the hours become emphasized. The day is compressed into binary
phases: day/night, dark/light, busy/still, loud/quiet. There is a connection to ritual and ceremony. The walks took place on the vernal equinox, a time of equal day and night, tying the piece to one of the most ancient of human celebrations, traces of which still exist within the holidays of present-day religions. The circular walk of viewers and the monumental scale of the display further highlight this connection to the most primitive of human experiences (the study and search for understanding of the basic mechanism of the day, year and heavens). This method of documentation, reducing human experience to its most basic cycles and forms, illustrates an alternative to the "collect everything" approach that digital technology seems to stress. A perfect example of this idea of ritual as communication is the Ise shrine of Japan. A temple that is considered to be over one thousand years old, the shrine in Ise, Japan is destroyed and rebuilt every twenty years to exact specifications and is currently in its 61st iteration. This ritual of reconstruction creates an object that has the air of the ancient but is physically new, it is the ceremony and its connected faith (Shintoism) that preserves and carries its message across generations. These methods put forth the idea that preserving the unique experiences of every individual is not important; it is the preservation of the continuum of common human experience over generations that has value. To connect oneself to the past and project one's effect on the future has a much deeper resonance than simply embalming one's present-day experience for posterity.
Figure 7: Top Two News Words (By Hour)

Top Two News Words (By Hour) (2007) combines massive data collection with the reduction of data. Headlines from 15 major news sources are gathered every hour, analyzed and reduced to the top two words most frequently occurring within the headlines. The results are then printed on a continuous sheet of paper that contains a record of hourly word pairs collected since the inception of the work. The piece grew from a personal frustration with the never-ending stream of "news" available online via RSS (Really Simple Syndication); I found myself spending large amounts of time consuming this information but having little time to digest what I had read since there was always more information in line waiting to read. I had the superficial sense of being connected with my world while at the same time having a deeper feeling of isolation. I was so overwhelmed by data that I had lost the ability to place the information into a
personal context and suspected the information that appeared to be important was actually
distracting filler and really had no substance. The system was built to focus the broad expanse of
the 24-hour news cycle into an easily digestible form that would allow an observer to look at it
from a distance, as a whole, rather than from the inside where one can easily be distracted and
overwhelmed. The resulting piece, while seemingly cold and mechanical with its computer
display, impact printer and continuous paper sheet with monotype print, fosters introspection in
the viewer and initiates discussion among groups of observers. Seeing an output of the words
"IRAQ IRAN" over days long stretches is not unexpected but the desensitizing effect of the
constant drumbeat of war and conflict is a surprise. The sterile printout illustrates how war has
become a form of "background radiation", omnipresent and ignored. The mechanics of news in
the 21st Century keeps us up to date but out of touch. The moments that do break the
fundamental frequency of war are also telling. Kurt Vonnegut's death (and therefore his life) was
important enough to break through and make an appearance for a solitary hour but this data point
was completely obscured by the constant appearance of Don Imus's name over a period of days
surrounding his controversial remarks. The words PARIS and HILTON competing with the
words BUSH and LIBBY for the top two spots is another discouraging sight. When multiple
people scan the output, discussions are initiated over the content: "Why the word MEGA?"- "Oh,
someone won the lottery"; "What happened in Japan?"- "A reactor leaked." Dialogue that has
disappeared because we consume our media in isolation is rekindled by an inert collection of
technologies. Artists have often acted as a filter, finding ways to reduce the incomprehensible
into a form that allows others easily process what was previously overwhelming. In technology-
based work such as Top Two News Words, the art lies in the manipulation and reconfiguration of
already existing channels of communication which helps bring about an understanding greater
and more engaging than that which is found when the content is presented in its (supposedly) pure and unadulterated form.

Within a culture, objects that are considered valuable and objects that are considered garbage are equalized over time. Archaeologists will often learn as much from a culture's refuse as from its monuments. What a society deems important provides insight into the character of that society but does not necessarily provide a complete picture of that society. The dominant members within a culture most often control legacy but the passage of time often neutralizes the inherent bias that dominant forces place upon an era. However, when a culture such as our own moves from physical methods of documentation to digital methods, the passage of time no longer neutralizes bias but eliminates content itself. Much of what will remain physically of our digital society will be the containers for information (computers, disks, tapes) not the information itself. In the past, mundane correspondence, sketches, toys, etc. could provide later generations with insight into the everyday life of a lost community or even alternate readings of the accepted history of a people, but with the finality of the digital destruction of information, the determination of what is valuable and what is not ends with the present day. Those in the future will not be given the opportunity to create their own interpretations or re-determine the relative value of information that was once discarded. By transferring the ephemera of the digital realm to the physical realm through encodings on non-volatile materials such as stone, the digital artist can bring to the forefront issues relating to the temporary nature of our digital environment.

What will be preserved? What should be preserved? In addition, as the digital documentation of an era fades away, the physical documentation by the artist will remain as an alternative or possibly a replacement for the historical narrative once applied to the era.
The Rosetta Stone is an archetypical form for illustrating the transmission of cultural data across centuries. Created in the third century BC, it features a decree in three languages carved on granite describing the successes of King Ptolemy V. While the value of this stone at the time of its making was political, nearly 2000 years later it became the key in deciphering the lost
meaning of Egyptian hieroglyphics. Projects such as the golden records enclosed on the Voyager deep space explorers and the Rosetta Project by The Long Now Foundation are inspired by this example; however, they are very specific in their intent (the preservation of the Earth's languages) and are ironically dependent on advanced technology for decoding (the golden records require the construction of a phonographic device to play them back; the Rosetta Project disk requires a 1000X microscope for reading the majority of its text). Rather than using the Rosetta Stone as a literal, scientific model for my own explorations in the preservation of culture, I use it as a symbol of permanence and transmission on which to build a series of works featuring text and images laser cut on granite tablets. Using stone and more specifically granite as the base for these pieces not only directly references archaeological artifacts but also references the monumental, both on an individual scale (grave markers) and on a larger scale (national memorials to war). Over the course of history, stone has been the material on which humanity has encoded information that they wish to survive beyond their relatively short life spans. When creating content for these works I did not consider a present-day audience as a viewer but an audience living centuries or even thousands of years hence. Scientific concepts and mainstream historical perspectives are the information most likely to survive over time either through careful maintenance of digital data, preservation by official institutions, or even by word of mouth, so I chose more mundane aspects of modern life to encode in stone. In Message for the Future 01-09 (2007), granite tablets are filled with simplistic, short sentences describing aspects of present-day society: "We drive our cars across the street. We drive our cars across the city. We drive our cars across the country..." The assumption made is that future translators of the text will be more likely to understand simplified syntax when compared to conventional modern writing. In addition, the primitive wording on the tablet evokes the voice of a soapbox rantor rather than the
voice of reason (i.e. a "neutral" scientific or historical voice), emphasizing the bias found in all communication. These responses are an integral part of the work. When a present-day viewer encounters these tablets, questions inevitably arise about the ability of such an effort to effectively transmit the message across time: "How do you know this will be understood in 10,000 years?" "Why is it written in English?" "What about all those people who don't drive, who don't have cars?" etc. While the tablet is superficially designed to be a message to the future, the deeper intent of the object is to spark an awareness of legacy and bias. We are engaged in a game of telephone with the past and the future and while all generational transmissions will undoubtedly become garbled, this fact does not excuse us from the responsibility of preserving what we deem as important for the future. Digital technology provides humanity with unprecedented control over information and communication; yet it also has the potential for creating a black hole in history; a dynamic era lost in time because of its dependence on volatile media. If all that remains of our world are the tools we used rather than the unique voices of individuals and peoples, we will be as unknown to the future as those who lived in prehistoric times. There is a limit to how much can be learned from abandoned stone axes and arrowheads or from abandoned computers and cameras.

Our culture has a tendency to view history as a linear progression where each day, year or decade brings social and technological improvement over the past. In reality, human history is more cyclic; there are times of great progress followed by times of great regression. Empires, like people, follow a pattern of birth, growth, stasis and death. Throughout the modern era, science has held the promise of ever increasing benefits for the human species, yet as technology becomes more complex, so does the process of maintaining a technologically advanced lifestyle. Progress has its price. Nuclear proliferation, dependence on non-renewable energy, and the
compromising of the Earth's ecosystem are but a few of the negative aspects of our technological advancement, any or all of which could contribute just as much to the disintegration of the modern era as to its growth. Within pieces I've created such as *Message for the Future* and *Amber Suspensions* (chips, resistors and other electronic parts embedded in an amber blocks), there is an implicit reference to "The End", a time when life as we know it no longer exists. A time when the world we live in is buried under the detritus of our descendants, waiting to be rediscovered. Some view the works as apocalyptic, conjuring thoughts of a sudden, destructive event that violently halts modern society and sends it back to the Dark Ages. Others, including myself, see the works as a reminder of the temporary nature of what we often view as permanent (language, nation, quality of life, etc.) and the inevitable evolution of human culture. Regardless of how our current era comes to a close, acknowledging that there will be an end and taking into account what will be left of us for future generations to build upon is a necessary trait for a truly enlightened society. The website futureme.org allows users to send an email to themselves up to thirty years into the future. Creating such a message can be an unsettling experience. The minor distractions and details of the present suddenly become much less important; one's focus turns towards mortality and what one wants from their life in the long term rather than in the next week. It is my wish to create the same kind of experience for an individual but in terms of society and culture as a whole- to find a way to push the viewer out of a blinkered, shortsighted view of the world facilitated by the blinding ease and comfort of modern technology.
Conclusion

Just as distributed systems have begun to profoundly alter our relationships to media, to information, to knowledge and to each other, they have begun to have an effect on the arts and the role of the artist within these new communal spaces. Because the arts are a conduit through which culture is defined, redefined and understood, it is essential that artists adapt to and become fully versed in new social technologies rather than simply engage with them. The creative technologist combines the technical skill of the programmer or engineer with the aesthetic sensibilities and conceptual foundations of the fine artist not only to negotiate the intricacies of online experience but also to create and revolutionize the very structure of experience. This is not a reversion to a more primitive method of art-making; an update of the artist as craftsman, where skill with a brush is replaced by skill with code, but a direct evolution from the trends of conceptual art in the late-20th Century. Now more than ever, in a culture where experience is increasingly filtered through a virtual construct accessed through a visual interface, those with a foundation in the fine arts are needed to assist individuals and society in navigating, understanding and controlling this massive new force for communication.
References


