Caught in the Grid: Towards a Digital Minimalism

Patrick Lichty

Part I: Introduction: Boot Sequence

In the practice of digital arts and more specific New Media, many stylistic and methodological genres have come into existence. Tactical Media, Flash Art, Contagious Media, net.art, ASCII Art, Virtual Reality, Telepresent Art, and others all have distinctive contexts around which they are created and operate. Within the digital arts, there appears to be an emerging form which incorporates low resolution, a technological sparseness, or a tactical use of these to create a cultural context specific to the work. These works, although by no means a 'movement' in the traditional sense of a concerted front of affiliated artists interested in creating a unified statement, seem to share certain distinctive qualities. This genre, which this essay will categorize as Digital Minimalism, draws from fundamental traditions of Western art traditions, elements of Modernism and the post-, and exhibits common elements which resurface throughout the histories of art, science, and technology. In this chapter, I intend to explore aspects of these histories and draw associations between them to make an argument for the convergence of certain visual devices (such as the Grid) which derive from empirical study of perception, and are echoed in numerically-based representation in digital art. Furthermore, it is also my position that digital culture has reached a point in its own history in which related art forms can now reflect on the digital art form and the cultural history of computation, including photography, personal computing, and video games. It is through this convergence of cultural themes that has led to the emergence of a digitally minimal style, if not genre, and it is this text's intent to explore the ramifications of this particular form.

Throughout history, the confluence of events have led to the emergence or reiteration of conversational threads and/or Aristotelian topoi (topics) in society and culture. Although these are the sources for essays in themselves, examples could include 19th Century

movements such as Theosophy and Spiritualism inspiring Kandinsky or the Nabi, scientific developments in optics and human perception conversing with Impressionism and Pointillism, the dawn of the technological age spawning Dada, Futurism, and the Bauhaus, among others. This is not to say that one necessarily has a direct cause-and-effect relationship to the other, but are indicative of a zeitgeist which creates a favorable environment for the development of these ideas. To paraphrase Kandinsky, much art (and culture) is a product of its time, but logically so.

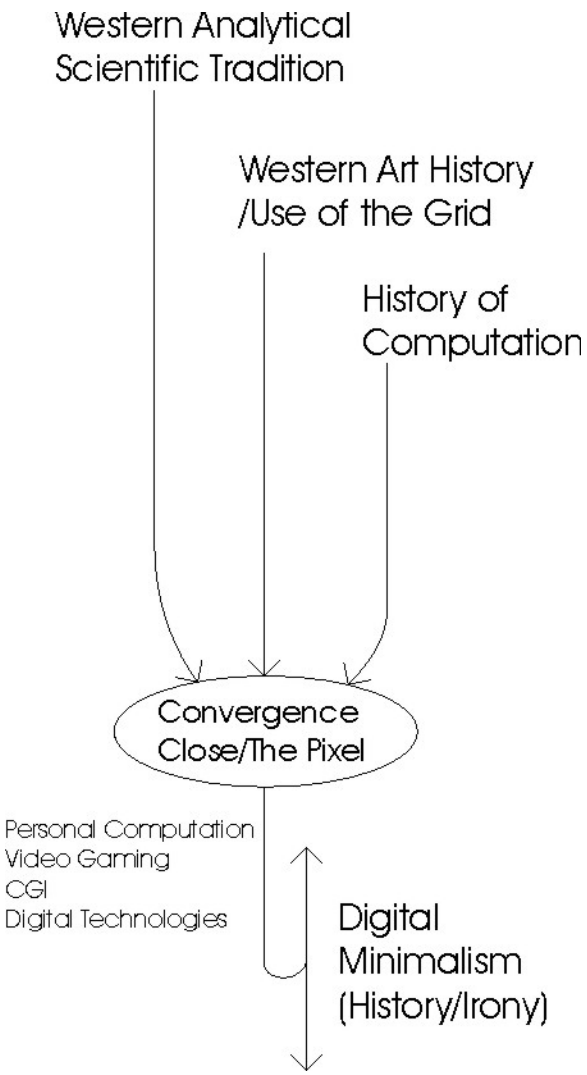
There are paradigmatic structures that reiterate throughout Western society that come from impulses as basic as the desire to describe the nature of perceived reality. These include mathematics, perspective, measurement, and geometry, all of which date from around or even before the Classical era. For the purpose of this essay, I will be addressing the use of the grid, primarily from Durer and DaVinci to Close and Hockney, and its reiteration through numerical representation in the McLuhan-esque technological prosthetic of computer graphics systems. It is this writer's position that this 'common framework' is no accident, as these structures reflect basic human perceptions of the physical world and the conventions humanity has contrived to try to understand it.

At the turn of the Millennium, one may contextualize the coming of digital culture, the Internet, and the like as a Fukuyama-esque “End of History?”[1] in terms of the digital culture's arrival signifying a radical break with the past. Although Fukuyama's essay dealt with the end of the Cold War and the coming ubiquity of Liberal Democracy's negation of many of the functions of history, similar proclamations have been implicit in the history of technological culture. Aldous Huxley's book, *Brave New World*, the movie *Shapes of Things to Come*, and Disney's EPCOT amusement park are all promises in which technological culture will supposedly

liberate humanity from its troubled past. This echoes the statement given by the Picard/Locutus Burg entity in Star Trek: The Next Generation (a prime embodiment of the technological culture), where he states, “Resistance is futile. Your life as it has been, is over.”[2] This is the dream of the Modern and the technocrat; the liberation from the limitations of the physical, the self, and from history through the application of technology. However, nothing could be further from the truth.

Without the cataclysmic destruction of an entire civilization and all of its related artifacts, human history remains influential to subsequent generations which come in contact with it. The fact that I refer to the Aristotelian concept of the topoi [3] as evidence, as is the Neoclassical genre of art. Drawing so basic of a conclusion may be overly reductive in nature, but it indicates that the present is continually shaped by the past. In this essay, I argue that Digital Minimalism refers to Modernist influences such as formalism and specificity, while also allowing for Postmodern qualities such as irony, deconstruction, and self-reflexivity. This is no paradox, as it is simply an example of the overlay of past cultures as informants to the present.

The terminal point in this discussion of Digital Minimalism is such a layered discursive model built from the historical arcs of art, science and technology. These come from antiquity to the 18th Century, then meet in an epistemic singularity in the late 1990's through the highly pixellated work of Close and others, and then spirals out into the conceptually-driven work of digital artists like Cory Arcangel, JODI, and Andy Deck. It is through this description of history, synthesis of events and discussion of exemplars of the genre that this author will make his argument for the existence of the digitally minimal.



Epistemological diagram of the development of Digital Minimalism (by the author, 2005)

Part II Loading Digital Minimalism's Historical Operating System/

Locating the Ghosts in its Machine

As mentioned, the historical framework for the development of minimal aesthetics of numerical representation reach back to classical times, and include the histories of Western art traditions, technology, and science. Note that science as such will be dealt with with less detail here, and more as an 'applied' form of same, as the linkage between the development of Western art and technological traditions is more germane to the subject at hand, although

the former is no less important.

Hacking the Grid: The Grid in Western Art Tradition

To address the grid in Western art narratives is to acknowledge only one device in a larger conversation. The use of geometry, etymologically the “measurement of earth” dates back to the use of the Platonic solids described in the Timaeus [4], and proven later by Euclid. Plato suggested the ordered structure of the world through the equivalence of the elements to the five congruent convex polyhedra (cube, dodecahedron, icosahedron, octahedron, and tetrahedron). Of course, there is no small irony in that in early computer graphics development, all shapes were, in fact, created by the composition of basic regular shapes, or primitives similar to the Solids.

Probably one of the most important elements to the evolution of Western art is the development of Euclid's five postulates of planar geometry, written around 300 BC, of which the fifth allows for the formation of the plane as a geometric entity. They are:

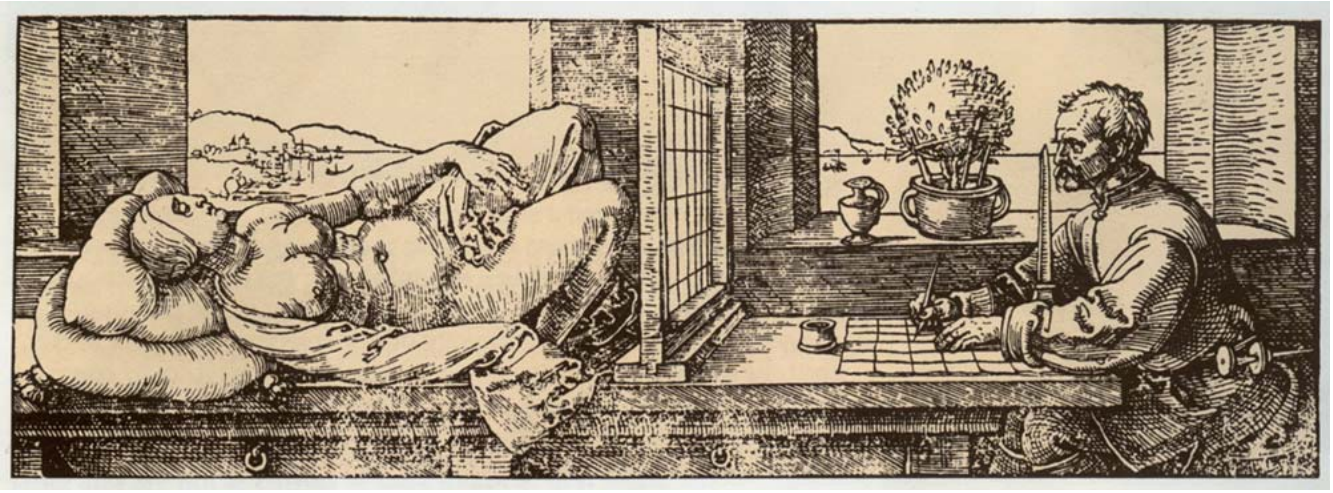
- A straight line may be drawn between any two points.
- A piece of straight line may be extended indefinitely.
- A circle may be drawn with any given radius and an arbitrary center.
- All right angles are equal.
- If a straight line crossing two straight lines makes the interior angles on the same side less than two right angles, the two straight lines, if extended indefinitely, meet on that side on which are the angles less than the two right angles. . [5]

The Postulates are not the formulation of the grid as such, it does construct a planar geometry, and the groundwork for the creation of the grid. And although the grid as we know

it was not formalized until the 17th Century by the philosopher Rene Descartes, grids were used in many perspectival devices for the creation of painting and drawing.

Many versions of the “Drawing Machine”, especially those attributed to Da Vinci and Durer (see figure) were documented as early as the 15th Century. Leon Battista Albierti wrote the first general treatise on perspective, *Della Pittura [6]*, from which the “Albierti Frame” was considered as one of the most successful devices for the creation of accurate perspective. The National Portrait Gallery of London describes one of the devices:

> *This drawing machine is made up of a square wooden frame, across which horizontal and vertical threads are stretched at regular intervals to form a grid. A foot or so in front of this gridded frame is a rod, the same height as the distance from the bottom of the frame to the middle of the grid. This rod is important because, by lining up the eye with the rod and the centre of the grid, the eye is always fixed in the same position when looking at things. [7]*



Albrecht Durer, Demonstration of the Draftsman's Net, woodcut, 1525 [x]

As a brief digression, it should be noted that the use of the grid is the source of lengthy art-world controversy, as it challenges the purist notion that the artist's talent lies purely with the direct experience of perception and representation solely with eye, brush, and medium. In David Hockney's book, Secret Knowledge: Rediscovering the Lost Techniques Of The Old Masters [8], Hockney, along with physicist David Stork argue that paintings created by many of the Old Masters, including van Eyck, Da Vinci, Michelangelo, Holbein, Campin, Lotto, Caravaggio, Bellini, and Raphael were created using devices such as Frames, convex mirror, and camera obscura. Although the debate on the subject is still open, what is more interesting than the use of the devices is the impression that the use of technological agency of any kind alludes to the substitution of virtuosity with technology. This is an argument that has been made against the use of many technologies, including the camera obscura (as mentioned before), the photographic camera, painting from photographs, and especially digital imaging. When placed in this context, the conversation polarizes into an unresolvable opposition between the adherents, the detractors, only to leave the concerned individuals for whom the subject is not an issue.

For our purposes, the importance of the Albierti Frame and Camera Obscura is that, when considered in terms of three-dimensional geometry, they form the basis of screen-based grids and three-dimensional projection in virtual spaces. The viewpoint in the device is the same as the camera in a 3D virtual space, and the method of projection, although now described mathematically rather than mechanically, is identical to Albierti. From this we might be able to infer that the Frame is not so different from the computer screen when looking into a virtual world. Considering that the mathematical projection of the picture plane to the screen is so similar to the one in Albierti's Frame, one could imagine painting from the view represented from a first-person computer game with little conflation of terms.

Bauhaus: Art, Form Technology

In considering the formal aspect of a Digital Minimalism, it's impossible to ignore the profound influence of the Bauhaus in the synthesis of art and technology in terms of the plastic (and now digital) arts. The vision of the Bauhaus was a synthetic one, with Itten's emphasis on the spiritual, Gropius' interdisciplinary approach, and Kandinsky's essence in form, as shown in his *Point and Line to Plane[9]* . A quote from Gropius' *The Theory and Organization of the Bauhaus* illustrates this:

> *The brain conceives of mathematical space in terms of numbers and dimensions... The hand masters matter through the crafts and with the help of tools and machinery.*
>
> *...True creative work can be done only by the man whose knowledge and mastery of the physical laws of statics, dynamics, optics, and acoustics equip him to give life and shape to his inner vision. In a work of art the laws of the physical world, the intellectual world and the world of the spirit function and are expressed simultaneously.[10]*

Here, Gropius clearly argues for an integration of humanity, art, form, science, and technology. Of course, this reflects the co-information of genres, if not disciplines, that is evident throughout history. When addressing the impact of science and technology upon early Modernist art, one not only has to consider Impressionism, Art Deco/Streamline, Pointillism, Constructivism, and the Bauhaus, but also Dada and Futurism as well as Surrealism's reaction to these effects. The effects of technology upon form encompass a wide array of ideological foundations, and while Digital Minimalism's formalism tends toward the utopian simplicity of the former genres, its conceptualism is largely informed by the latter.

This is a subject we will explore in other terms later in this essay.

To return to the issue of form, Wassily Kandinsky's *Point and Line to Plane* reconsturcts the essence of planar construction as method of human expression. In the text, Kandinsky discusses the fundamental formal characteristics of all composition, and how those principles can be applied to human expression through the visual. In the book, he reflects upon the nature of the dance as having the word “point” [11] as indicative of a gesture. In Figure 9 of the book, he then expands this to describe the gestural characteristics of a dancer, Palucca through points and line. Later, Kandinsky argues that through formal use of the point and line on the picture plane, one can express weight, dynamism, heat, and emotion.

To translate the use of form and technology to contemporary times is not a stretch by any means of the imagination. This writer has argued that although the digital age has fundamental conceptual differences from Kandinsky's time at the Bauhaus, the application of formal principles still bear great consideration. On the screen, and in the virtual space-matrix, there are analogues to the elements used by Kandinsky in the pixel, the vector (digital line), and the grid (digital plane). The convergence of new developments in art and technology asks for the consideration of form and composition under these new configurations, and the elements of visual communication reiterate once more as we have discussed throughout this text. To take point and line to plane to the pixel and vector to grid is a logical progression and is the essence of Digital Minimalist formalism

Another precursor to the gesture of pixellation is Dali's *Gala contemplating the Mediterranean Sea which at 20 meters becomes a Portrait of Abraham Lincoln (homage to Rothko)[12],* also

known in mass culture as *Lincoln in Dalivision.* According to the Salvador Dali Museum:

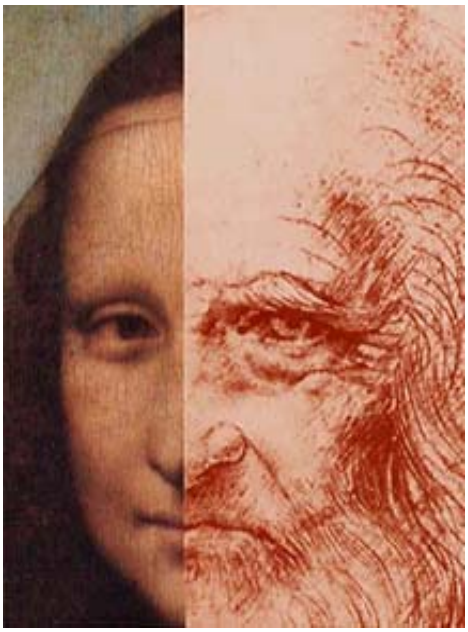
> *The painting is based on discoveries about perception published in the Scientific American; discoveries which prompted Dalí to convert the image of Abraham Lincoln found on the American five dollar bill into a painted portrait using only a few discrete painted pixels. [13]*

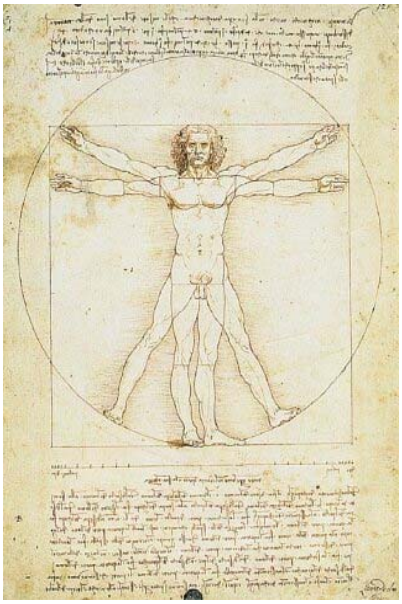
Gala contemplating the Mediterranean Sea which at 20 meters becomes a Portrait of Abraham Lincoln (homage to Rothko), 1976
Dali Museum, St. Petersburg, Florida, USA

This commentary alludes to the expression of a nascent mass digital consciousness on the part of Dali. However, it does not suggest the sole use of the grid as representational device, but more akin to a (post)modern expansion of his visual double entendres made famous in works like *Slave Market with the Apparition of the Invisible Bust of Voltaire (1940)*. And, although this painting is quite large [14], Dali's exploration of pixellation as perceptual device also suggests the the coming of a conceptual use of a digital formalism.

Leonardo, the Frame, and Morphogenic Mona Lisa

One other harbinger of the convergence of art, history, and technology on the pixel grid is Lillian Schwartz' *Mona/Leo* (1987) [15]. In this work created during Schwartz' time at Bell Labs, Schwartz used method to compare digital images of the Mona Lisa and sketch of his self portrait. The result was that the dimensional similarities were such that many experts concluded that the *Mona Lisa* was in fact Da Vinci's self portrait. However one also has to consider that Da Vinci was also a master of exploration of human proportion, as seen in his





Lillian Schwartz, *Mona/Leo*, 1987

Da Vinci, Leonardo, *Vitruvian Man*, *Grotesque Head* (1487-90)

ubiquitous *Vitruvian Man* and grotesque figurative studies. Schwartz' argument that *Mona Lisa* is a self portrait is compelling. However, the converse can also be said, considering his extensive studies of proportion and evidence that he used optical devices similar to an Albierti Frame, the argument could also be made that Da Vinci's composition was formulaic. What is most interesting to this writer in this case are the representational metaphors drawn by Schwartz between the Frame and the pixel grid through her study. However, the

convergence point between the cultural issues and qualities of digital formalism discussed in this text would not occur until Chuck Close's *Alex* in the late 1990's.

Convergence: Close: Alex

During the late 1990's, Chuck Close experimented with digital technology in regards to his use of photography and recreation through the grid. To quote the online colophon for the piece at the Cleveland Museum of Art:

> *This large, intense close-up of the artist Alex Katz (born 1927) is a part of Close's most recent group of photographs. Katz's staring visage, rich in textural detail, dominates this image which was produced by a new process for Close. Working with master printer David Adamson, Close digitally transferred the image from a 20x24-inch black-and-white Polaroid he had previously made to a computer graphics workstation. After making adjustments, he used a modified Iris printer and special archival inks to print the image, creating a work distinguished by its wide tonal range and lush blacks. [16]*

Close's digitization of his large-format Polaroid completes his application of the grid in his painting and takes it to its logical extreme, regardless of the resolution of the digital image. Verisimilitude breaks down, as Close's confluence of his use of the grid and numerical representation through the pixel grid inextricably lock the Frame and the pixel grid to one another as equivalent structures. The use of the grid since Albierti for the method of representation is stripped bare by Close to its bare essentials of tone and value in the numerical grid through the pixellation of the portrait. It becomes nothing more than the grid which alludes to the figure through which the piece seeks to represent. Regardless of his subsqeuent woodblock work with Pace Editions in the 2000's which incorporate analog

methods like Ukiyo-e, the use of historical methods become reflections after reaching the singularity of the pixel grid. Thus, after linking the Frame to the Grid to the numerical, the formal gives way to the conceptual.

Close, Chuck. *Alex* (1997) Collection of the Cleveland Museum of Art

Part III Hardware: Digital History and Reiteration of Topoi

To understand the historical arc leading to the convergence of terms in the 1990's around Close, we will briefly explore the historical foundations of visual numerical representation. The problem with this is that there are instances which hint at the coming of forms of graphical representation which are not necessarily numerical in themselves. The primary example of this is that of Byzantine mosaic, as seen in this example from Sixth Century Cypriot mosaic, contrasted with a Pixelblock [17]-based work by the writer. While the use of ceramic and glass shards with mastic were bound primarily to the contours of the image and were not necessarily gridded in the case of the mosaic, the use of discrete visual elements is clearly analogous to to the use of colored elements in the pixel grid To jump from Byzantine times to the digital era is a distant leap which asks a great deal of acceptance in drawing such

analogies. To try to a few more points to support this argument, we will examine two instances of proto- and early computational sources.

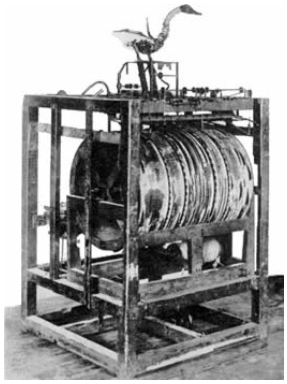
Sixth Century Mosaic Cyprus, *St. James,* (Courtesy Permanent Mission of Cyprus to the United Nations)

Patrick Lichty, *Religious Shortcut*, 2003, Lego blocks

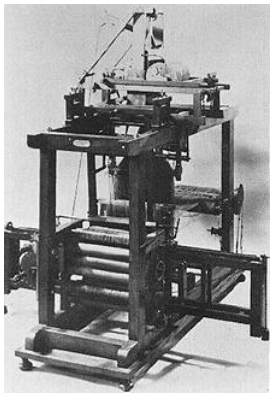
One of the most logical historical epistemic arcs regarding the evolution of numerical representation and/or visualization (which can be extended to the aesthetic) is that of the storage of data on cards and forms of punched tape. The history of the automated loom is a rich subject for a book, as the the 18th Century development of these from Basile Bouchon's 1725 drilled paper loom [18] reveals much about The development of this practice is often attributed to Joseph Jacquard's creation of a card driven loom, but this was a refinement of a 1745 design by another Frenchman, Jacques de Vaucanson.

The irony of Jacques de Vaucanson [19] is in that he is best known as an early developer of automatons (a fad of the time) which played music (the Flute Player and and mimicked biological processes, an interest he acquired after time with the surgeon Le Cat. The most famous of these is the Canard Digérateur , or Digesting Duck[20], which followed the Enlightenment proposition that animal life is analogous to biological machines. The Duck was

a device which would flap its wings, drink water, ingest grain, digest and defecate on demand, which also necessitated Vaucanson's invention of the first seamless rubber tube.



Canard Digérateur (Digesting Duck)



Vaucanson Loom

It would be his skill at automaton construction which would gain de Vaucanson an appointment by the French government as inspector of the manufacture of silk. French silk production had been falling behind that of what would become the United Kingdom, and Vaucanson was placed in charge of reformation of the French silk industry. His solution was the development of looms which would operate from punch cards, speeding the production of textile. However, these developments were not well received, and it would take another few decades for the punchcard to be adopted in the textile industry.

Joseph-Marie Jacquard (7 July 1752–7 August 1834) [21] continued Lyon's rich heritage of the development of the automated punchcard loom. Jacquard had a history as an unsuccessful weaver, who after a number of vocations came to develop a loom in 1801 which again would create its patterns from a series of punched cards. On its exhibition at the industrial exhibition in Paris, weavers would destroy this device in protest, but it would have him summoned to the Conservatoire des Arts et Métiers in Paris where he would then perfect the linked punchcard method. As we will see, Jacquard's method is the framework for all

mechanical data storage until the development of magnetic media, and is a compelling historical argument for the linkage of the numerical representation in the arts..

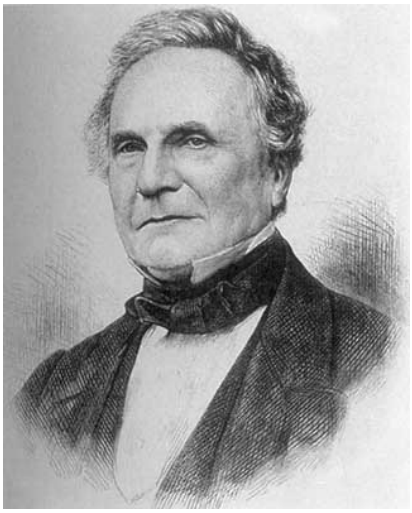
Joseph-Marie Jacquard

Jacquard Loom

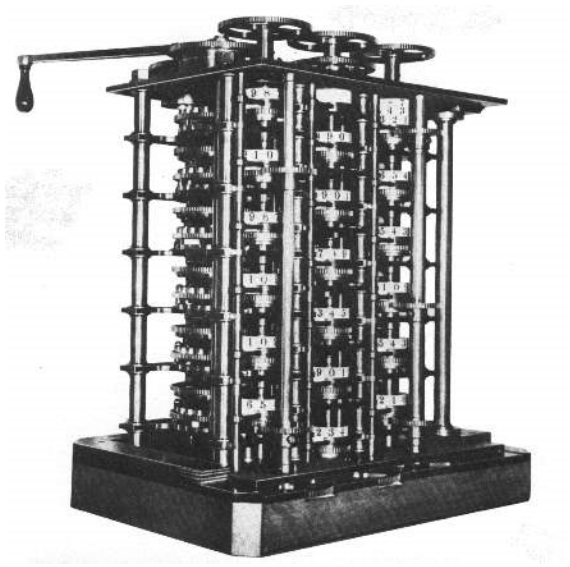
The history of Charles Babbage (1792-1871) [22] is far too extensive to cover in this essay, but in the development in automated computation, he is clearly known as one of the forebears of the modern age. A renowned mathematician and member of numerous Royal Societies, Babbage was involved in research in the field of calculus, recently developed by Newton and Leibniz (again a debate which is outside the scope of this text).

Babbage found a problem with the work of hand calculations of mathematical values such as logarithms and trigonometric tables. The work was inherently prone to error, if nothing else than from sheer computational volume. To solve this problem, Babbage conceived of a *difference engine* that would be capable of large strings of computations which would be performed without the problem of human error. The pictured device was built in 1821, and spurred on the inspiration for a larger *Engine* which would be capable of even greater

degrees of accuracy.



Charles Babbage



The Difference Engine

The second Difference Engine's complexity made construction prohibitively expensive and highly problematic. Babbage also conceived of the *Analytical Engine*, a mill for the analytical computation of values using cards and mechanical engines (using direct inspiration from the work of Jacquard). Unfortunately, this would would also never be fulfilled.

However, this work, developed also in conversation with Lady Ada Lovelace, would have great importance for the field of analytical computation into the 21st century. First, the Analytical Engine was thought to possess five logical components, the store, the mill, the control, the input and the output, most of which are analogous to the central processing unit, storage, and input/output devices in contemporary digital computers. Therefore, it is this writer's opinion that mathematics and analytical computation (Babbage/Lovelace), the artisan's craft (Vaucason/Jacquard) and their use of representational structures of cards and storage grids, which would be topoi that would be reiterated for decades. These reiterations include Hollerith's census punchcards [23] that would become data input devices for

computation until the 1970's, the foundation for music boxes and piano rolls, as well as other devices such as the tickertape, and the Edison Automatic Telegraph, which created punched tape from a keyboard for the automatic creation of telegraphic messaging. In short, the link between science, technology, and the arts reveal the structures of human cognitive processing once more in the conventions of numerical representation through Jacquard, Babbage, Edison, Hollerith, and as we will see, others such as Williams and Kilburn.

Manchester *Baby* and the Birth of the Digital Grid.

The one of the earliest examples of the grid in computational graphics is that of the first computer to execute stored programs. The Manchester Baby, built in 1948 in Manchester, UK by Sir Frederick Williams and Tom Kilburn two years after co-inventing the Williams-Kilburn Tube (or Williams Tube)[24]. The Williams Tube was a modified cathode-ray tube which uses the same technology that picture tubes for televisions utilize. The tube would display a grid of 2048 dots representing the 2048 bits of memory in the computer. The memory retrieval would then be done by a metal sensor plate placed in front of the tube which would sense the difference in electrical charge. From this effect, bit values would be retrieved, allowing for the storage of programs for execution, which was not possible before. The next year, the design was improved slightly to create the Manchester Mark I (1949) which used the Williams/Kilburn technology and was The computer was then produced with the firm Ferranti as the Ferranti Mark I. A version of this computer currently exists at the Museum of Science and Industry in Manchester (MSIM) in Manchester.

Williams Tube on the replica Manchester Mark I

Williams & Kilburn,

While the technology of the Williams/Kilburn Tube was a breakthrough in the creating a form of what is now called Random Access Memory (RAM), it was also prescient in the development of computational aesthetics. The grid of memory dots, although pragmatic in their use, resonates clearly with the use of geometry in Western empirical traditions by Euclid and Descartes, and makes a clear suggestion of the grid in the arts via the Albierti Frame, and the coming of digital graphics in under fifty years. Such a cultural convergence such as the Baby begs a further discussion of the Grid in Western culture.

IV: Synthesis The Grid – A Modified Anthropic Principle and the Topos

A question that comes to mind is why humanity returns to constructions of 90-degree

structures, rulers, grids, matrices, and reiterates them in abstracted/computational spaces? First of all, it is this writer's contention that while nature operates under many geometric structures other than the grid and matrix. There are abundant fractals in nature, as seen in structures as simple as the snowflake. Buckminster Fuller's geodesic geometry has allowed for the creation of domes and trusses that form the backbone of many free-standing structures. The problem remains; why did humanity pick the 90-degree angle?

It is this writer's belief that it follows from elements of anthropism; that is, that many of our assumptions, objective faculties, and so on are defined by our embodiment as human beings and the way we utilize space. This is an extension of cosmological hypotheses put forth by Dicke and Carter in 1957 and 1974 respectively [25] that states that humanity takes a part in the construction of the reality in which it takes a part. The Anthropic Principle has spurred debates about the nature of the relation of subjectivity and objectivity as well as “Intelligent Design” that states that the universe is too perfect not to have been created through outside agency. These issues most likely miss the point of the principle, and nevertheless lie beyond the scope of this text.

The Anthropic Principle seems more about embodiment of human perception and derivation of meaning of the world around us. For the sake of this discussion, humans, more or less, stand vertically, walk on an infinitesimally curved horizon, and manipulate objects and tools in what we conceive as up, down, forward, backward, right, and left. This construction allows for the maximum utilization of a space as human beings understand it, and the grid is an orderly tool for the sectioning and utilization of a planar surface by human sight and movement. There are other systems, such as the polar coordinate system, and rotation can be added to the Cartesian directions, but this unnecessarily complicates matters. What is important is that

within human existence, there is a repeating occurrence of the grid in surface, space, and design which corresponds to the embodied existence we inhabit. Undoubtedly this might be different if humanity we an n-dimensional being living in a weightless environment, and this is much of the point.

In Envisioning Cyberspace, Peter Anders argues for the construction of an “anthropic cyberspace” [26] in which human beings can use information architectures most effectively. In many cases, Anders suggests a remapping of human embodied space as an overlay to the virtual. This may be a fairly linear progression of thought, but even digital transarchitect Marcos Novak, who creates visualizations of hyper dimensional spaces, still uses a Cartesian screen coordinate system, as humanity does not readily comprehend non-Euclidean spaces in which the right angle does not equal 90 degrees. Likewise, it would be logical to posit that from Durer and DaVinci, and even to Vasarely's distorted op art of the 60's, the grid is also intrinsic to human perception in art.

Erikki Huhtamo's presentation on Media Archaologies at the REFRESH! New Media summit in 2005 at the Banff New Media Institute [27] brought up the idea of the Aristotelian topos, or rhetorical place of argument to which we often return. We can see this in many artistic genres. Oliver Grau pointed this out in his book Virtual Art [28] that Roman initiation rooms of the Bacchic cult, panoramas, IMAX cinema, and Virtual Reality all are reiterations of the immersive. Huhtamo explores this through reflecting on the rhetorics of realism or verisimilitude in art and technology, which is again reiterated in many of Grau's subjects as well []. What is interesting here is throughout science, art and many other disciplines that ideas, the grid for one, serial imagery for another, the living portrait, are fertile ground for the reiteration of topos for in the context of given time.

The convergence of anthropism and the grid as topos comes through Marshall McLuhan's assertion that all technologies and human devices are merely prosthetics of the human organism. In his landmark book The Medium is the Massage [29], He firmly states that “All media are extensions of some human faculty, psychic or physical.”, and apparently extends that to all devices in saying that “the wheel – is an extension of the foot, the book – is an extension of the eye, electric circuitry – an extension of the central nervous system.” This can also be expanded to say that media, to use Fein's analogy [30], are likewise synnoetic in that they extend human cognition as well. Following from this,we reach a startling conclusion. According to McLuhan, technology of any kind (sic) is not only anthropic, but anthropomorphic, in representing an extension of the human form. This can be one explanation for the topoi of the grid throughout Western art and scientific traditions as perceptual tropes that are reiterated on art, in mathematics, and on the screen.

Part IV Software: Defining Digital Minimalism

It's arguable that a digital aesthetic has existed since Jacquard's 'programmable' looms and the Manchester Baby and Mark I computers' use of the Williams Tube as a memory device. However, digital technologies have reached a saturation and maturity where entire generations have lived in close proximity with relatively sophisticated computational devices. There are artists working in the digital and New Media forms, such as Roman Verostko, Lillian Schwartz and Charles Csuri who have been practicing for up to three decades or more. There is a historical legacy which has been created over the past two hundred years, even from as recent as the video gaming era, which has created a more or less common cultural database. From this, digital artists and/or New Media artists are then challenged with examining the distinctions of their genre and deconstructing the constructs of their milieu. For the time being, technological change shows little sign of deceleration. What then, are the distinctive

and defining aspects of digital art, what are the specificities of digital works, and how can we address the intrinsic qualities of the digital through complex, yet concise terms? These are some of the questions facing the digital art, spanning its Modernist and Postmodernist foundations.

In particular, the Digital Minimalist is concerned with formal distinctions of the representation of computational aesthetics, which even video games exhibit. What is it to work in digital art forms? In his seminal essay, *Video: The Distinctive Features of the Medium*, [31] David Antin examined the formal and cultural differences between television and video. This writer interprets Antin as saying that while television is institutionally produced in studios and transmitted by stations, video is created by smaller agents and independents with small studios and portable decks, then distributed through the tape. Television is top-down; video is from the margin or from the bottom up. Television is slick; video is raw. These metaphors are apt points of conversation (or Aristotelian topoi) for the consideration of the digitally minimal.

In order to further reflect on the nature of the construction of meaning through digital media to determine its distinctive qualities , it may be useful to consider thought from related genres. Lev Manovich, in The Language of New Media [32], defines five principles of New Media art. These are numerical representation, modularity (the creation of work consisting of many pieces of digital media), automation/program-driven elements, variability, and transcoding, or the translation of works into different forms through the use of different media on the computer. For this discussion, numerical representation is specific to the digital. It also frees digital minimalism from computation, but discussion of this loophole would create undue digression, and is a subject for another time. Also, the ideas of variability in that digitally

minimal works can be represented in a variety of methods, and transcoding is of great use as well, and may be a second focal principle beyond numerical representation.

Digital Minimalism is a genre that comes from New Media and becomes a trans-narrative by focusing on reflection on numerical representation, or self-reflexively using clearly digital forms as part of the work's narrative. However, it is not a cohesive strategy, as it is an emergent genre born of artists who are aware of one another, but are not necessarily of one ideology. It is a method, a representational strategy, and sometimes a politics. It reflects on the form specific to numerical representation, the technologies this it is specific to. In this way it alludes to Judd's ideas on three-dimensional art in the 1960's [33]. Numerical representation, and for clarity I will set aside the notion of transcoding, varies widely by the agendas of the artist, but can be reduced to the number, the byte (series of eight ones and zeroes), nybble (four ones and zeroes, and the bit (or Binary digiT, a single one or zero). It follows from Rothko's statement of locating complex terms through simple expressions [34]. In effect, the essential visual Digital Minimalist work might be two pixels (the visual unit for expressing visual information on a computer screen), one white, representing maximum numerical values, and one black, representing the minimum value of the essential digital element. This alludes to the space in between, and the tension represented by the large potential between those values.

Interlude: Between the bits – Digital Minimalism and the (post)modern; 1/0

As mentioned earlier, the concept of the digitally minimal reduces the nature of numerical representation to their most basic elements. It considers the bit (the point), the byte (metaphor for the line), and grid (or plane), as well as matrix (space) and time. By this reflection of point, line, and plane as elements of digital representation, my formal meditation

returns to that landmark book by Kandinsky on the same subject during his affiliation with the Bauhaus. Perhaps my return to the links between art and technology typified by the Bauhaus are no surprise as well, not to mention the return to form as another topos that arises as artists confront new methods and cultural milieus.

But this idea of Digital Minimalism is a convergence. Here, the form of numerical expression, history and context of technology, Western art historical traditions via the exploration of scientific and philosophical principles through art, and cultural effects all intersect. As with Close's *Alex*, or with Dali's *Lincoln in Dalivision*, we arrive at the event horizon of the Modernist singularity of pure form. At this point, the digitally minimal rests between the two bits, the one and the zero, almost like the moment a master Japanese Shodo calligrapher prepares to place the brush on paper with infinitesimal but effortless precision. Likewise, the Digital Minimalist places the pixels and bytes, seeking the simplest expression for an almost infinite number of possibilities. This mirror's Rothko's assertion of Minimalism's expression of complex ideas through simple expressions. The digitally minimal, in its arc toward essential form, specific to its cultural and historical contexts, races toward smaller and smaller grids, smaller color palettes, smaller resolutions, and coarser audio sampling rates until its discursive arc snaps through the gravitational well of the singularity of form.

If this form were emergent in the middle or end of the 20th Century, the digitally minimal may only be wholly formal in scope, and there could be endless grids of black and white pixels. But Digital Minimalism is as self-reflexive as it is formal. It represents the realization of the limitations of digital form and likewise arcs out to consider the histories and culture that caused its emergence. Sometimes this is done intuitively through irony (Arcangel), cyberpunk aesthetics (Slocum), kitsch (Arcangel), and also through and analytical interrogation, as with

Simon, Magruder, Zuniga, Zanni, and others. Humor emerges as well, as these artists are the first generations who have 'been digital', to paraphrase Negroponte.. Now that the digital culture is recognizing its history, its denizens also realize its idiosyncrasies and ironies, and understand the peculiarities as well as the specificities of its milieu.

Reaching the Postmodern: “The Street Finds its own Uses for Things” (Gibson)

William Gibson wrote in *Neuromancer*, the book credited with coining the word Cyberspace, that “The street finds its own uses for things”[35]. In that, Gibson's cyberpunk vision, typified by contemporary turn of the millennium do-it-yourself culture typified by the magazine Make, s Digital minimalism represents what Haraway might consider a fractured identity of a cyborg sensibility[36], fusing objectivity and subjectivity through form and irony. It is a bricolage of form, humanity, and techne. The technological artist, and especially the one employing digital media, has merged itself with its McLuhan-esque prosthetics. Conversely, while the techno-prosthetic is an extension of the body, the artist is also the ghost in the proverbial machine. McLuhan or Haraway might argue that the technologically enabled being is a literally melded hybrid of flesh and machine, like that of the Borg in the television show Star Trek:The Next Generation. This writer counters while he may not agree with such a literal interpretation, there is an extension of the self and of the body no less real than the utilization of the lever's extension of the arm. It is the ability to reflect on the teleology of digital technology through historical referent and irony that signals some element of maturation in the formation of the digital culture as a mass phenomenon. The digitally minimal, then, is a self-reflexive move as well as a formal one.

A second function of the self-reflexive nature of the digitally minimal is its deconstructive nature in that it takes the position that digital culture is by definition created by systems of

codes. On one hand, one could take the stance that Net-based interaction is based on a the interaction of people sharing social 'programs' or interactions through code via a net. However, one could go further to consider that human expression done through digital agency is dependent on a system driven by machine code. These codes are then interpreted by a series of layers of machine translation, or 'protocols', as Galloway calls them [37] to create systems of human interaction, or human/machine interaction. This is the assemblage of code-systems that reflects the cyborg identity and creates the digital culture upon which the Digital Minimalist reflects.

There is one other problem which Digital Minimalism addresses, and this is the doppelganger nature of the digital. As the flexibility of media production progresses with digital tools, there seems to be a tendency towards the mimicking of previous forms of media. For example, some forms of digital video are being created at 24 frames per second to mirror video, and the resolution of digital cameras are approaching that of traditional film. This shift obscures the formal qualities of the digital form through emulating previously extant media, or which this writer calls 'Emulationism'. While this is useful from the teleology of the digital medium-as-tool, it also carries with it the elements of New Media (as defined by Manovich) which insinuate themselves into the production of the digitized form of film, audio and so on. This implies that emulation or verisimilitude of an extant form does not equal the medium itself, no matter how faithful the reproduction or emulation. To deny the emulation of other forms then foregrounds the nature of the digital as centered upon elements of numerical representation and their systems of processing and exchange.

Foregrounding the digital also refuses the agendas of capital and production which demand the constant upgrade; the latest revision. Although this writer also critiques the forward edge

of technoculture through the *Alpha Revisionist Manifesto* [38], there is also a likewise position at the trailing edge as well. This is done by engaging the memory function in reminding the digital culture of its structures, its histories, and its methods of signification through referring to the bit, the byte and the matrix in its most basic formal terms. In this way, the formal aspects of Digital Minimalism are a multiple signifier, in considering form, context, history, and human/machine symbiosis.

Part V: Executables: Punks, Interveners, Critics, and Digital Minimalists

As said before,Digital Minimalism is not so much an ideology, despite the author's rather dogmatic observations in the previous section. It appears to be more phenomenologically-based, in that it fits series of criteria relating to aspects of numerous artists' works over a given period of time. Works exhibiting aspects of the low resolution, minimal hardware, minimal data and so on can have radically different functions, but they all seem to incorporate a foregrounding of the pixel or the byte in a formal and self-referential fashion.

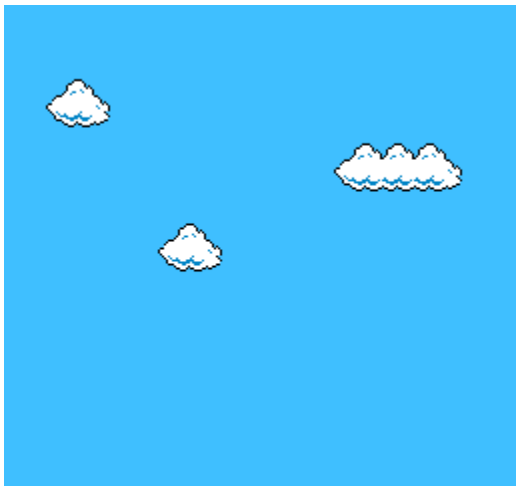
As of this writing (Dec. 2005), this writer sought to engage what he thought were some of the earlier practitioners of the form, but during the writing, a show at vertexlist gallery in Brooklyn called *SUPERLOWREZ* [39] is featuring new works by artists such as Kristin Lucas and Matt Freedman which also exhibit elements incorporated in this chapter. To go beyond mentioning this exhibition would be unwieldy, as it would begin to lose itself in documenting an increasing number of works which are indicative of the larger trend of the digitally minimal. Therefore, all apologies are given to all subsequent artists working in this vein for any omission.

But before describing works by a number of artists whose work reflects aspects of the topics discussed in this essay, their differences and divergences cannot be stressed enough. While

their methods often intersect, the engagement with the subject varies greatly; some are punks, some address formal characteristics of numerical representation, others look at the digit critically and with circumspection. It is through this survey that this author hopes that some of the diversity , as well as commonalities can be discerned.

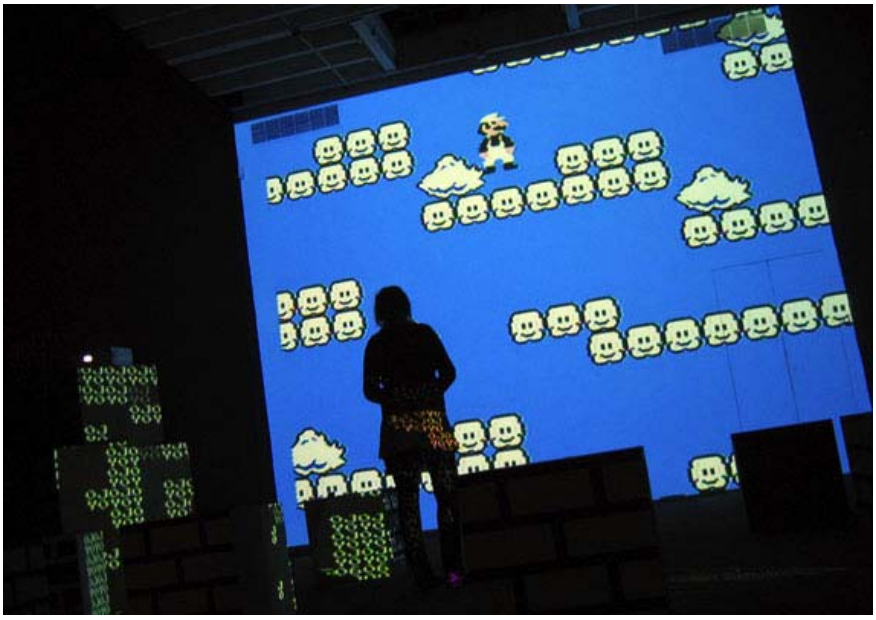
Cory Arcangel

One of the more noted purveyors of the pixel is Cory Arcangel of the Beige programming collective. A self-styled digital retropunk, Arcangel's persona of the 'hacker kid' who cracks old Nintendo cartridges and makes music on Commodore 64 computers (perhaps his dad's?) is a playful reprise of late 80's video game culture. His seminal work, *Super Mario Clouds* [40], is a rewritten Super Nintendo Entertainment System (SNES) cartridge that has been reprogrammed so that all elements of the classic game Super Mario Brothers have been removed, leaving only the gently moving background clouds in the background. Commenting on this particular work on the public radio show Studio 360, Arcangel mentioned that he wanted to inject some frustration into the game console by creating a game cartridge that had no elements of the game left, and that the user really could not interact with much. [41]



Cory Arcangel, *Super Mario Clouds*

By using Super Mario Brothers as his topos, and by extending it into a sort of opera through the Deitch Gallery event, *Mario Movie* [42], Arcangel accesses multiple histories and cultural referents, both through cultural context and associated aesthetics . For instance, the use of the vintage video game console technologies refer to 80's and video game nostalgia. Admittedly, the sense of nostalgia may be more for the demographic of the targeted patron than the producers. Arcangel's personal use of the SNES, and Commodore 64 personal computer for that sake, creates an ironic space full of nostalgia for technologies that were probably deemed obsolete in his early childhood That is, Arcangel's work creates a false nostalgia for pixels generated from repurposed 'junk' video game consoles. The important part to note is that it was not done with an Xbox or Playstation 3,4 or 5, but an old Nintendo box.



From Cory Arcangel: *Mario Movie, Deitch Projects, Jan. 2005*

His 2002 Turbulence Commission, *Data Diaries,* [43] is a series of Quicktime videos of “Core Dumps”, or visual representations of the data obtained by extracting the information from a computer's memory at a given time. That data is then reformatted that data so that the Quicktime video playback software interprets the information as video data. .Here, Arcangel

uses a punk/minimal approach in aesthetics and production in that, for the most part, what is the 'art' is a recontextualization and (re)presentation of raw data as art object. As Alex Galloway mentions in notes on the Data Diaries site,

> Every so often an artist makes a work of art by doing almost nothing. No hours of torturous labor, no deep emotional expression, just a simple discovery and out it pops. What did Cory Arcangel do in this piece? Next to nothing. The computer did the work, and he just gave it a form. His discovery was this: take a huge data file--in this case his computer's memory file--and fool Quicktime into thinking it's a video file. Then press play. Your computer's memory is now video art. Quicktime plays right through, not knowing that the squiggles and shards on the screen are actually the bits and bytes of the computer's own brain. The data was always right in front of your nose. Now you can watch it. [44]

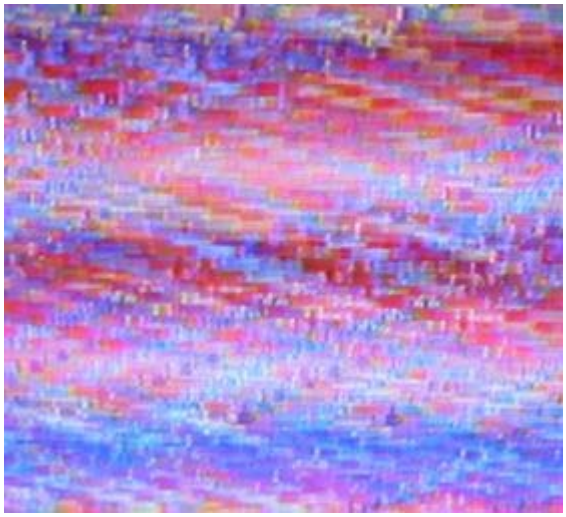
Cory Arcangel, *Data Diaries*

As Galloway mentions, Arcangel's art is in the hacker's connection, saying, “Oh, isn't that cool?”; the punk noodling for hours in the living room with the old Pixelvision camera making weird images. But where Arcangel's geek-core junk-tech tomfoolery separates itself from random experimentation is its self awareness. As in the *Studio 360* interview and personal

conversations with this writer, Cory is having fun, but he's also questioning digital culture, he's questioning craft, he's mucking around with the art object to no end. Behind the gawky dirt-style geek, Cory Arcangel reveals a keen insight for playing with the boundaries of retro chic, minimal digital pop aesthetics, and the absurdities of the art world.

Paul Slocum: Atari VCS 2006

Another artist who deals with a sort of grunge-style digital minimalism is Texas-based Paul Slocum [45], who also participated in the events surrounding the Deitch Projects' *Mario Movie* installation. Slocum is also known as part of the digitally-minimal genre Arcangel calls “Dirt Style” which relies on the quick, incomplete and discarded in technological art; in essence something close to a techno-Merz (a la Schwitters). Slocum's works consist of live electronica performances using reprogrammed Atari 2600 video game systems (the first widely used machine to use game cartridges), installations using retro computers, dot matrix printers and the like. Counter to Arcangel's anti-craft use of retro and minimal digital aesthetics, Slocum's work relies on skills such as using painstaking assembly code on old Atari consoles, retro physical computing that drives 1980's printers as musical instruments, and other interventions which require an extreme degree of programming craft. His work is meticulosusly shoehorned into the miniscule size of an Atari memory chip, while Arcangel's work dissects, discards and throws together remnants of digital detritus. Slocum's geekpunk aesthetic derives from the cyborg repurposing of antique personal computation seemingly as a statement of an arcane necro-technical virtuosity and a refusal of contemporary deterministic high-techne.



Atari 2600 hack by Paul Slocum

Finally, Paul Slocum also promotes community adoption of these platforms as art creation devices through the creation of loop and sequencer-based music program cartridges for the Atari 2600 video game console, as well as homebrew games like his prototype based on the popular Internet cartoon, *Homestar Runner*[46]. The *Synthcart* for the Atari 2600 is distributed through AtariAge.com, a company dedicated for independent development of do-it-yourself Atari programmers, and is a regular on Atari homebrew online mail lists. So, although not intended as such, his engagement with minimal/retro systems also supports one of the niches which generates part of a vibrant digitally minimal cultural scene.

Alex Galloway: transformers

One other game platform minimal work that plays with the cultural hack is Alex Galloway's *transformers[47]*. In the series, clips from feature films are reduced to a 2x2 pixel resolution, and then programmed into repurposed Nintendo GameBoy cartridges as super-low-rez video. The first of the series consists of a 3:04 video clip from the 80's giant-robot cartoon series of the same name. Transformers accesses many of the same cultural geekpunk themes as Arcangel by referring to themes popular at the height of 80's gaming while showing the Do-it-Yourself raison-d'etre of the hacker culture. *Transformers* degrades the digital time based

image to its logical extreme and places it into the cultural milieu of the retro handheld game, again creating a wonderful irony in creating a digital artwork on an interactive platform that has complete abstraction no interactive qualities whatsoever..

Alex Galloway's *Transfoirmers* GameBoy video

John Simon: *Every Icon*

John Simon's *Every Icon [48]* addresses the fundamental question of numerical representation by sequentially creating all possible graphical combinations in a black and white 32x32 pixel grid. The piece progresses by counting, starting with an image where every grid element is white, and then incrementing each element from white to black until every element becomes black. The use of 64 bytes, if eight black or white bits is a byte, represents all formal combinations of icons represented by that matrix. In doing so, the signifying potential of the space is then accounted for by those 1024 pixels .

Although the image changes rapidly when Every Icon begins, the image progressively slows down. Every Icon is counting from zero to 2^{1024} in binary, one bit at a time, as each pixel

represents a 'decimal place' in the 1024-bit long binary number, and to travel from completely white to black requires sequentially going through each number until all combinations are explored. Simon's piece asks a hard conceptual question, as while exploring all combinations of the first row of pixels will take a little over a year at 100 combinations/second, the next line will 5.85 billion years to complete. By using the possible combinations of a simple grid (referring to artists as early as Durer, and analogous to Rothko's metaphor of the simple expression), Simon engages a difficult conceptual question, which is so practically complex as to be unresolvable in practice.

Given:

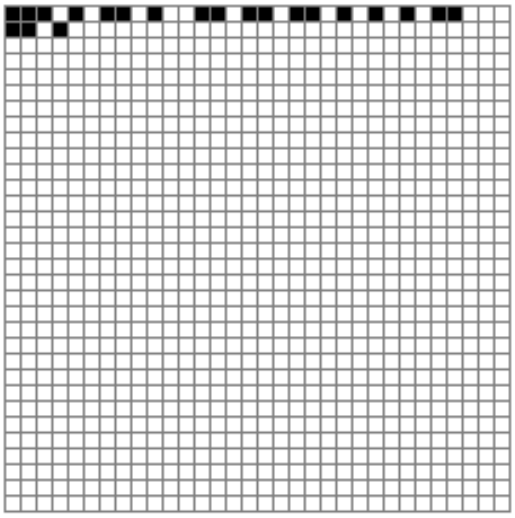
An icon described by a 32 X 32 grid.

Allowed:

Any element of the grid to be colored black or white.

Shown:

Every icon.



Owner: John F. Simon, Jr.
Edition Number: Artist Proof
Starting Time: January 27, 1997, 09:42:30

Carlo Zanni: New Portrait/Portrait as Icon

While John Simon's *Every Icon* uses the minimal gesture to make distinctions about the numerical representation and computational potential, Carlo Zanni's 32 x 32 pixel *Portrait as*

(Computer) Icon [49] series is symbolically playful with its multiple cultural interpretations of the (computer) icon. One of the most obvious cultural referents which Zanni draws from is the ubiquitous desktop screen icon, which can represent anything from programs, data files, movies, or just the icon itself. The other historical referent that Zanni alludes to is Susan Kare's ubiquitous smiling Macintosh symbol (itself a 'portrait'), which appeared during boot sequences on Apple computers for nearly two decades decade until around the turn of the millennium. In fact, Zanni even makes this link by including Ms. Kare as part of his ouevre.

Carlo Zanni, *Portrait as (Computer) Icon*

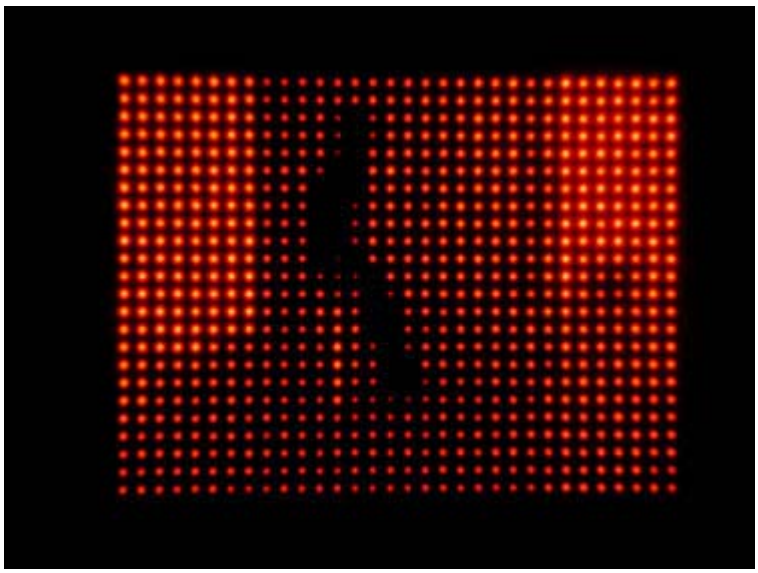
The Portrait as Icon series then doubles the humble desktop icon as a basic signifier of formal numerical representation in the graphically-based computer environment and referent to 'cultural' iconography. For example, Zanni's iconic portraits include 'icons' of the computer culture, such as Susan Kare, Peter Norton, Nolan Bushnell (founder of Atari and creator of Pong), and Linus Torvalds (developer of the LINUX operating system). In addition, the 'icon portraits' also include noted New Media art names such as Mark Tribe and Miltos Manetas, broadening Zanni's definition of the 'icon', a basic sign of numerous cultural and representational issues.

Jim Campbell: Process(ed) Experience

One of the formal concerns not explicitly outlined in the discourse of Digital Minimalism is that of embedded systems, small platforms, and so on. This may have been alluded to in the case of Slocum and Arcangel, but in their case the works reside, by and large, on already extant repurposed systems. In the case of Jim Campbell, many of his works are represented

through displays driven by small single-chip computer systems. On his website, Campbell describes a *Formula for Computer Art* [50] that is an animated graphic describing any number of inputs, a computational processor, and any number of output devices.

The beauty, if one can ascribe such a quality to such a process, is the mixture of simplicity and flexibility of the system. For example, the inputs in Campbell's diagram include sound, biometric information, sound (from environmental noise to speech recognition), meteorological information, economic, geological, and astronomical data, ad infinitum. Once captured, the 'experiential' information is processed by the computer's programming and then translated into sound, motion, text, graphics, heat, wind, and so on. In a way, Campbell's work exemplifies a form of algorithmic process art through a minimal computational system that reflects on basic human experience.



Motion and Rest #1, 2001

Custom electronics

In his *Ambiguous Icons* series [51], Campbell explores existential moments in the aforementioned while also considering the formal representational issues that occur when display resolution reaches the point of obvious abstraction. In the Motion and Rest

Series,small clips of digitized video of figures oscillate between positions of action and inaction. This video is abstracted in that the display consists of a 768 pixel (24x32) array of light-emitting diodes which projects the image onto a frosted sheet of plexiglas, creating a blurred representation of a digital image at roughly the resolution of a desktop icon (32 pixels). The low resolution is antithetical to cinematic computer-generated verisimilitude, but nevertheless speaks enigmatically about embodied experience with directness and simplicity.

Andy Deck: *Glyphiti*

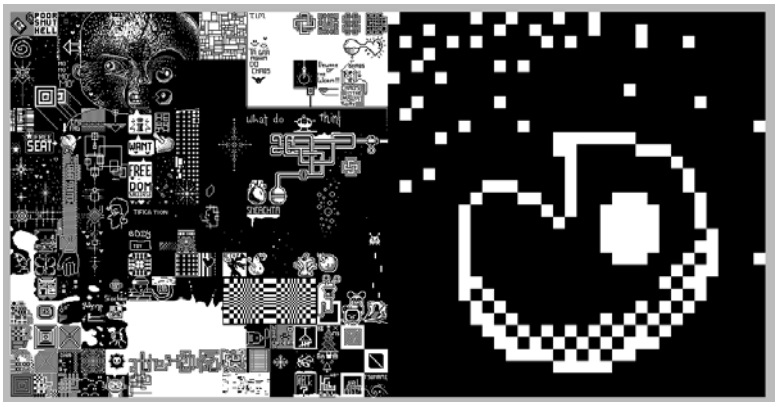
Another work that alludes to the iconic is Andy Deck's Glyphiti. The work is a collaborative online panel that is a composite image consisting of a 32x32 grid consisting of black and white 32x32 pixel icons. There are two viewing panes to the work; one is the left half which consists of the composite image as it stands. The other half is an enlarged detail of any one of the 32x32 images within the larger one in the left side. Upon selecting one of the smaller icons, and having it appear in detail in Glyphiti's right side, the visitor can then modify it at will, with the changes reflected more or less in real time in the left half, revealing the visitor's collective digital graffiti.

Deck's commentary upon the work is prescient in that he posits that his work is a reiteration of topoi as ancient and basic as Roman graffiti. He writes:

> It should be noted that glyph imagery is nothing new. Mayans and Egyptians used glyphs, and the word 'glyph' comes from (ancient?) Greek ('carving'). More recently, there is the work of Kenneth Knowlton, who in the 1960's used computers at Bell Labs to create images composed of glyphs. I first encountered one of Knowlton's pictures -- which seemed to combine Chuck Close and the teletype -- at the School of Visual Arts

in the early 1990s. [52]

A number of points are inscribed within this paragraph which parallel the historical narratives leading this author's development of elements of Digital Minimalism. Although this essay does not address Mayan and Egyptian graphic devices, it could be argued that the pictographic languages used by both of these civilizations constructed their visual communications through grids of symbols, in which the symbols themselves could be abstracted to pixels. This is also carried through in the Classical era, where mosaic, although often non-rectilinear in its placement of elements, predated Durer, Close (pictorial construction through the grid), Seurat via Pointillism, as well as the computer pixel grid in its construction of images through the representation of discrete color/tonal elements. Deck then acknowledges the history of computational imagery and its adoption of the grid through, in part, the work of Knowlton, to be synthesized by artists such as Close in the 1990's Glyphiti then takes this Western art historical narrative, combined with the history of computation, then reflects upon it after their convergence in the 1990's, making visible the historical consciousness of the moment. It shows this ironic reiteration of topoi by constructing the Roman graffiti wall on the Internet, inscribing the complex art/historical narrative in a method clearly expressed in a minimal manner on almost any basic Web browser.



Andy Deck. *Glyphiti*

M. Takeo Magruder: (re)collections

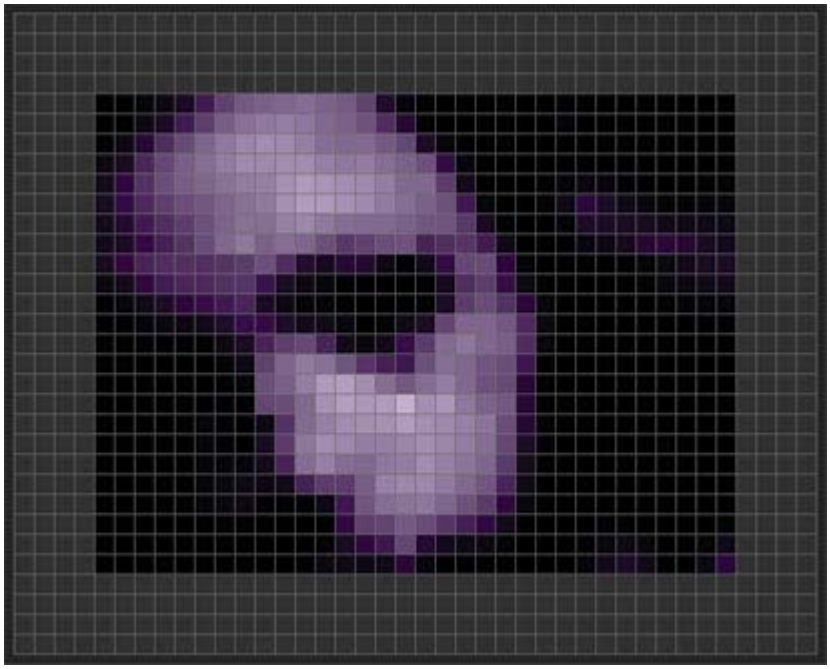
Michael Takeo Magruder uses the devices of numerical representation as as an analytical representation of the cultural memory function. His work, often highly-pixellated video embedded into web-based installations, are critical pieces which question the nature of mediated reality, whether from a personal or institutional perspective. Quoting from my critical essay on his work from the net:reality exhibition catalogue:

> [Magruder's] practice exhibits a New Media formalism in the representation of information, a seeming Matrix-esque obsession with the same as the fabric of reality, and the use of that information to create a form of "real-time media criticism." Through the combination of aesthetics, code and analysis, Magruder's artworks show a deep understanding of New Media culture, and the technologies that form its foundation.
>
> Magruder's developments in the aesthetics of information are best illustrated in Encoded Presence1 and Re_Collection2. In these pieces, the video as signifier of the real is abstracted, foregrounding the issues of digital mediation. The image aliases and so reconfigures into a Close-seque hinterland between real-time representation and digital minimalism. In both pieces, clear remnants of the physical are evident, but the image is now unapologetically digital.[53]

Much like Campbell, Magruder pulls apart the digitized video image to the verge of unrecognizable. Furthermore, his video pieces also incorporate a grid overlay, eliminating any ambiguity regarding the connections between the historical referent of the grid in Western art traditions and computational art. My reference to Close in regards to this body of work, gleaned from conversations with Magruder for the creation of the catalogue text, reify the assertion that the move toward pixellation is indicative as one of the distinctive qualities of

Digital Minimalism comes from the cultural convergence indicated by works by Close and others in the 1990's.

Encoded Presence [54] is a clear example in which the grid-based portraiture of Close has been expanded into time-based media by artists like Magruder, and by the author of this essay. In the piece, three cycles of a 32x32 pixel video (again referring to ongoing digital tropes) reveal the image of a young woman brushing her hair back and then receding into the background. The sequence repeats, once in red, blue, and green, signifying the phosphors in a computer monitor and the additive color model used in screen-based media, in many ways referring obliquely to Seurat and Pointillism. In many ways, *Encoded Presence* parallels Jim Campbell's LED work in the way he takes the minimal dynamic image and test the levels of reduction until abstraction takes over.

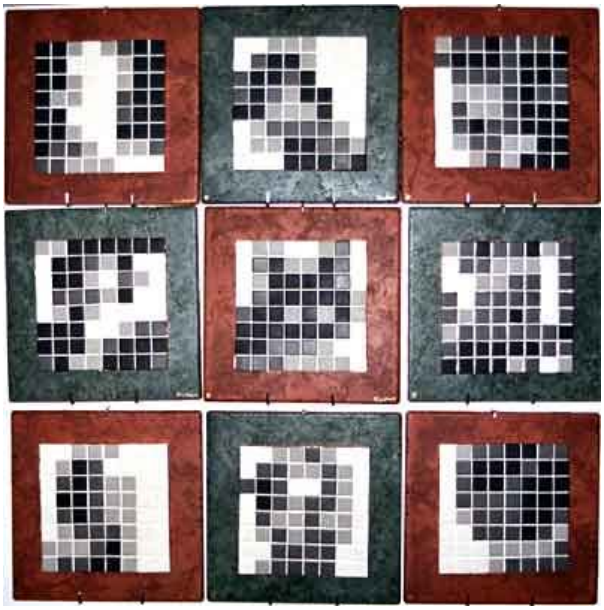


Takeo Magruder: *Encoded Presence*

Patrick Lichty: Event Horizon

There is always a difficulty in including one's own work in an essay such as this in that it threatens to reveal any host of errors from simple narcissism to self-contextualization. This is a risk that one has to take in such an event, but it is my hope that the work discussed, taken in context with the other work, exhibits sufficient continuity with the historical and contemporary arguments placed in this essay that a reasonable argument for some level of objectivity is warranted. In addition, for literary continuity, I will discuss the work in a 3rd person voice.

The distinctive quality of the many of the Lichty works is the often extreme nature of its low resolution. Even in the case of the *8 Bits or Less* video series [55], the time and resolution constraints are taken down well below those used in industrial media. For example, 8BoL utilizes wristwatch camera serial imagery delivered at 1/8th of the usual frame rate, and at close to 1/8th of usual video resolution as a stylistic choice, referent to early photography such as Daguerre and serial experiments by Muybridge. Such choices used are often unexpected for digital media which often are linked to the verisimilitude associated with previously extant media. In addition, media choices like ceramic tile, oils, and laser-etched wood or stone are direct historical referents as well as queries to issues regarding technological media in Western art traditions.



Patrick Lichty, *Portraits in 8 Bits or Less*

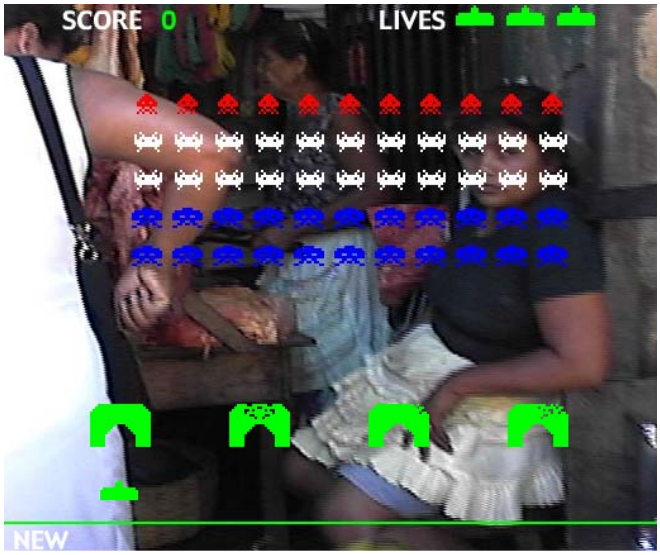
Much like Deck and Magruder's use of the portrait as artistic touchstone, the *Portraits in 8 Bits or Less[56]*, consisting of 12” square representations of 8x8 pixel portraits using ceramic tile in black, white, and two levels of gray refer to the Byzantine mosaic. In addition, the image resolution of 64 dots total presses the image towards total abstraction. .The compositional and formal challenges which were already created in part by the limitations of the use of the black and white wristwatch camera used for *8BoL*., are reduced even further by the use of four tonal values and reduction to 1/15th of the original resolution. The image almost ceases to question the portrait, leaving only a hint of one, but then challenges form, history, and medium. The logical extension of this arc towards abstraction would be to enlarge the pixels from one inch square to one foot, or one meter, referring to the dimension of Dali's large-format canvases which referred to pixellation.

However, the *Pixel Dyptich* (2003) turns to the logical implosion of the digitally minimal, consisting of two shadowboxed ceramic pixels. Pixel: RGB 0,0,0 (black) and Pixel: RGB

255,255,255 (white) create a discursive field in which all values in between the single black and white pixels are alluded to by the contextualization of the two objects. From the extremes of the range of digitally-based graphical numerical representation, the two lie at the origin of the graphical grid, suggesting that all potentials issue forth from between the two values, as after tone and color are introduced, line, area, space and time are logical extensions of this opposition. The difficulty with such a work is that it sets a formal extreme for the genre, and begs for different engagements in form or for a radical recontextualization of such works.

Ricardo Miranda Zuniga: Politics of the Pixel

Not all artists using Digital Minimalist qualities are concerned primarily with the formal. Ricardo Miranda Zuniga's political New Media works are informed by popular digital, business, and consumer culture. *Space Invaders* [57] is a reworking of the classic Taito game, but is recontextualized as a comment on economic colonization of Central and South America by American corporate interests. Red Whits and Blue 'invaders' menace the player on a background of Nicaraguan poverty, with Uncle Sam and Ronald McDonald flying high above the fray. The specific aesthetic of the Space Invader links so directly to digital pop culture and writings such as Baudrillard's which posited that war had become a video game that it becomes unmistakable. The minimal aesthetic in terms of digital culture is not only one of form, but as suggested throughout this discussion, links to very specific cultural sites with compelling messages.



Ricardo Miranda Zuniga, *Space Invaders*

Debug: A Reflection on Male Hegemony

Although this is a potential chapter in its own, some mention should be made of the gender issues related to the selection of artists contained in this essay. At the time of this writing, few female artists were known to this writer that exhibited elements of qualities of Digital Minimalism. During the research for this essay, only video artist Kristin Lucas was found, and she was preparing to show a non-disclosed electronic work produces with Biteditions of Philadelphia at Brooklyn's VertexList gallery. I feel that this is indicative of the convergence of male dominance in high art (as pointed out so well by groups like the Old Boys Network and Guerrilla Girls), and the historically male involvement in technological industry. Although much of the New Media and technological high arts have had excellent levels of diversity, as shown at annual festivals such as Ars Electronica[58] and ISEA[59], but the digitally minimal qualities seem to be expressed by male artists at the time of this writing. Or, at least, mainly males are visible.

Such a statement is a query and a challenge. Is it actually true that digitally minimal qualities are being created by a predominantly male culture, and if so, what does this say? Is this a

Mulvey-esque reinforcement of the male gaze in the digital arena? This is an ongoing point of curiosity, and I invite information that refutes or confirms this apparent observation. But, if found to be correct, another invitation is tendered in that any voices with interest in these issues should be seen and heard as their perspectives are essential to a larger reflection on the digital culture.

Part VI: Output: Summary

The development of a theory of Digital Minimalism is more of a quality, style, or genre than a movement. This cultural phenomenon is one born of the confluence of numerous events and influences deriving from the histories and traditions from Western art, science, and technology. To say that intersections between these societal currents have not occurred through a sizable portion of recorded time is a misnomer. However, there appears to be a cultural moment at the turn of the millennium which is manifesting itself through multiple forms which are specific to the digital. These include a formalism which explores the pixel, small systems/discarded technology, small databases, and low resolutions (visual and audible) which are informed from a panoply of sources from the grid(s) to the Bauhaus to the Minimalists who include Rothko and Judd. It also challenges the verisimilitude and technological determinism of aesthetics which merely seek to emulate previously extant forms, as the digitally minimal artwork is specific to both its form and cultural locus.

I(also realize that this essay is probably far longer than any of the Minimalists of the late 20th Century would have desired. Referring back to Rothko, I would understand any possible admonition he might have for such a lengthy text, given his thought on complex ideas and simple expression. I counter that in this writer's case, a stronger argument may be made for any work made under that rubric than any surrounding theory. I would much rather posit a

detailed, jet lengthy reflection on a genre and let the work operate with freedom.

Conceptually, the existence of a digital mass/pop culture since the mid 1970's has created generations who have never been outside of its influence. Many artists in the new generations of digital conceptualists may not have experienced early digital culture such as the video arcade scene of the early 80's, or even the video game boom of the late 1980's. From this, certain ironies and forms of kitsch arise from false nostalgias for times that the art audience may identify with, but the artists themselves may never have known. This is the irony of the first digital generations, and signifies a maturation of that culture which only comes from the accretion of sufficient history to feed that maturity. The emergence of this historical consciousness is evident from the 2005 REFRESH! Media history conference and from numerous books and media seeking to address the subject of digital history. And, genres such as Digital Minimalist works interrogate the histories of western art as well as Those of history and culture. This body of inquiry is one which seeks to root itself firmly into the matrix of cultural history. It also suggests an integration of the human, the technological, and the formal in a sort of self-conscious cyborg humanism born of the aforementioned maturity (or at least late adolescence) of the digital culture.

To reiterate, the emergence of the digitally minimal work of art is not so much indicative of a movement as it is a style, genre, or perhaps indicator of larger historical phenomena. This is a move which roots itself firmly into the mesh of Western historical traditions that reflect the cultural and electronic code of the digital zeitgeist. As Kandinsky wrote that all art is a child of its time, so is the emergence of the digitally minimal work of art. It is specific to its time, its tools and its culture, but also informed by the lengthy traditions which inspired it. Therefore, the many distinctive social, cultural, and technical aspects which define the

qualities of the digitally minimal and the contexts which shape the conversations and milieus in which it operates mark a similarly distinctive period in history for a culture emerging from its adolescence to become part of the larger discursive matrix.

Part VII: Resources:

Author's Note on the References:

I understand that a portion of the research contained here is derived from the Internet. While care has been taken in selecting reputable sources, the writer would like to do further print-based research to solidify said references.

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