

# Troiage Aesthetics

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## Abstract

As the world around us is transformed into digitally enabled forms and processes, aesthetic strategies are necessitated that can serve to articulate the multiple layers of complexity involved. I have developed an approach to this through a number of projects that engage a formal and conceptual vocabulary derived from collage, montage and assemblage. This triple "age" (I'll call it troiage), renders surprising zones which articulate more than just the edges of a formal transformation of culture, but reveal aspects of social structure itself. One approach to put these mechanisms of articulation into play is by looking at binary relationships such as nature/culture, personal/public, U.S./Mexico, freedom/coercion, mediation/experience. This aesthetic approach is connected to, and develops from, a number of disparate areas of art and cultural history.

## Style and Aesthetics

Developing an "aesthetic" is a culmination. It is the result of intentionality, intuition, capability, accident, history, talent, intelligence, ignorance, resources, education, patience, frustration, passion, acuity and myriad other ways to slice and dice ones self and ones situation. However, unlike a passive reflection upon the stuff that one has done, there is a suggestion of self-consciousness in the process. If overdone, or with a lack of flair – it will be condemned as contrived – lacking the genuine insight of a work that has the emergent property of a "life of its own". So while I can make a set of arguments for the validity of my aesthetic, it is based as much on circumstance as on intent. For this reason, I will describe some of the key trajectories which, when coupled with a more critical view of culture, provide an axis of operations for this aesthetic sensibility.

## Developing Aesthetics

In the development of an aesthetic style, perhaps my overriding concern is to look at modes that have an efficacy. This efficacy arises from conceptual interests, and the extent to which the refinement of expressive gestures within the domain of this style create works that are revelatory of the contemporary human condition as effected by the developments of culture.

This doesn't mean that one should search for a style that has a utopian open-endedness, but rather to look for

systems of generative constraints. It is within the boundaries of these constraining conditions that a catalyzation can occur. It is necessary that the systems of constraint have some apparentness for a viewer, in order that they are able to achieve a self-conscious engagement with the art experience, engaging in a useful interactivity with the work.

This system of constraints can be thought of in similar ways to how "mediums" used to be conceived. With computing, the notion of something called a medium is much more complex than it was with discrete media such as painting or photography or cinema. Computing has become a meta-medium, simulating all previous media forms<sup>1</sup> as it becomes a platform for the continuous invention of new "mediums" of expression driven by the interests of its content. While there has always been some bi-directional relationship between the evolving structure of mediums and the content of individual works, within the realms of digital media we have the opportunity with each new work to create - or at the least make considered choices about - their own media forms in entirety. The media form that is generated might last for 10 years and million's of works will be created with its expressive attributes or perhaps only one work will utilize its forms. Examples of this can be seen in such areas of recent digital culture as the CDROM, the web (will it exist in 10 years?), flash, VRML, the CAVE, Quicktime VR, blogs, etc... and most any form of an artist created multi-media installation environment.<sup>2</sup>

If my interests as an artist are centered around the engagements of computing on culture (which I will accept as a definition for the moment), what would I understand to be some of the generative constraints of computing that provide a worthwhile catalyst for aesthetic exploration?

## Computing as a Medium?

Mediums of expression emerge in leaps and bounds, prompted by technological and/or socio-cultural

<sup>1</sup> "Real Art and Virtual Reality" by Sheldon Brown, ACM SIGGRAPH Computer Graphics, Volume 31, Number 4, November 1997.

<sup>2</sup> See for example any of the works off of my own webpage [crea.ucsd.edu/sheldon](http://crea.ucsd.edu/sheldon) – each of them constructs a mechanism for framing meaning that has content specific derivations from more ubiquitous forms.

developments which enable new expressive modalities – and are then incrementally refined. We can see this in the development of the book (and its transformation by the printing press), painting (its history of development in relationship to such developments as perspective or modernism), photography and film. Each of these mediums continues to develop and transform, but there are moments where major modalities were formed by broad strokes at particular points in its history.

Computers have been around for some time, the moment of its invention is a bit contested. For the sake of this argument I'll take the Eniac's operational debut in 1945 as the point of departure for the modern era of computing<sup>3</sup>. At roughly the same time, television was coming into being.

As mediums for cultural expression, however, television and computing have provided two very different development graphs. When video was deployed, it did so with many of its attributes fixed by government mandate. The form of television still in us today in the U.S. – NTSC –was established in 1941 by the FCC<sup>4</sup> and still operates with major expressive components fixed from that day. Computing also has some of its major attributes fixed by the Eniac, however in this case these attributes have a bit of different character. What the Eniac fixes for computing are its use of Boolean logic to engage binary representations of data in a Turing machine architecture. These elements are still very much at the heart of today's computers, just as the NTSC TV specification is very much at play in today's televisions, however we know the granularity of these computational principles has been doubling every 18 months or so. It has been about 708 months which means that the computer power has doubled 39 times since the Eniac<sup>5</sup>.  $2^{39}$  power is 549,755,813,888.

<sup>3</sup> The Computer, from Pascal to von Neumann by Herman H. Goldstine Princeton University Press, 1972

<sup>4</sup> Federal Regulation of the Radio & Television Broadcast Industry in the United States: 1927 - 1959 by Robert S. McMahon, Arno Pr; Reprint edition (January 1980).

<sup>5</sup> the ENIAC could perform 5,000 additions or subtractions or 360 multiplications of two 10-digit decimal numbers in a second. <http://www.upenn.edu/computing/printout/archive/v12/4/crackpot.html>

A 3 Ghz P4 (which weighs considerably less then 30 tons that the Eniac weighed) does about 6 billion floating point operations per second or about 16 million times more then the Eniac. At the high end – the Earth Simulator computer, run by several Japanese scientific research agencies in yokohama, (<http://www.top500.org/lists/2003/11/1>)measures about 40 teraflops, or about 100,000,000,000 times faster then Eniac – so somewhere between the P4 and the current supercomputer champ is this misapplication of Moore's Law (which was actually coined to describe the growth of transistor density on a chip).

Moore's law is rough – but relatively accurate, our computers are about a billion times more powerful then the Eniac. There was only one Eniac in 1945. Today there are several billion computers of widely varied computational capacity. But we could also say something about the total number of pixels that have been generated since 1945. Back then we had a few screens generating these pixels, and now we have billions of screens – and their growth is now being transformed by Moore's legal tenant.

Television was invented to be a medium for creative expression. From the start it was developed and refined around the combined notions of cinema and radio for how it would operate and be optimized. Computing was developed to break codes and calculate gunnery tables. In the development of computing, it wasn't primarily driven by the needs of cultural expression. Those modes would come to it later on, and would develop relatively slowly as it took time for computing power to develop to the point that it could process such things as audio streams, temporal image streams and synthetic environments.

Computing is mutable and continuously extensible, in a manner that is qualitatively different then previous cultural forms. While there can be said to be some quantitative relationships between the growth in the number of electronic pixels and the number CPU cycles in existence, the quantitative expansion of CPU cycles brings new qualitative modalities under their control. The extant to which is a point of interesting debate. Is it infinitely so? Is it at least as much as our own brains? Or is it a bound system, forever enticing us with its potentials, but there never is a catalyzing effect that quantities of Boolean operations will achieve – they will just make a more and more amazingly complex watch, but they will never be able to actually create time.

Creating art with this situation presents some very different characteristics then with other contemporary tool domains. Making art that has an apparent engagement with computing (treats computing as its medium) means you are working with a toolset that is in a perpetual state of becoming. Whatever the aesthetic or expressive components are that derive the work will have their fidelity trumped tomorrow, and possibly extended or combined with a new modal form as well. For instance it wouldn't be too much of a surprise to consider a highly effective olfactory interface being invented. So if the modalities and fidelities are at best transitory with computing, are there more essential elements that can be employed to constitute a medium out of which a style can emerge?

## Triage

Mediums do what they do, because that is what they do. Computers do Boolean operations on binary numbers, shuffle them around, interpreting them to represent things.

They do lots of this, really fast, but they don't really do anything besides that. In fact, I could get even more atomistic about what it is that computers do, and say that everything that they do can be built by just tying together a bunch of NAND gates. All states of digital culture could be broken down into a NAND gate construction. At the base of every computational gesture is this fundamental act. Looking at the edges of the computationally derived forms, at the limits of its expressive edges, you will find these Boolean operations creating its frayed edges. Artists spend a lot of time on these frayed edges, looking at those points where meanings fail and the normative and the abnormal exchange places.

Since nothing is actually captured and fixed in a computer – the computer operates by simulating all of its representations. (in difference to photography where the light does make a physical transformation of the object). In computing we can capture these events, but then we can continuously change how we want to interpret them. My digital picture of the Mona Lisa can be turned into a bit stream for playing on a sound synthesizer, or it can form a behavior system for a flock of micro robots or it can be the control code for the Tokyo traffic light system. This protean transmutation is surely one of the key attributes of computings' potency. Developing an aesthetic sensibility that effectively comments upon and derives from these attributes is a key aspect of the “trojage aesthetic”.

A couple of things that should be explicitly pointed out in the coinage of this aesthetic, is that it makes an explicit nod to its meta-medium operation, and it makes explicit engagements of three antecedent forms – the imagistic, the spatial and the temporal.

### **Collage - the imagistic antecedent**

The creation of virtual worlds<sup>6</sup> consists of defining a space within which subsets of its space will be used to draw pixels that mimic visually what it would like if an object inhabited the space under the rules by which that space is governed. That is a lot of qualifying statements to describe a visual form that uses the culturally familiar Cartesian space designations. But I am explicitly delineating components of this to clarify the many contrivances that are utilized to create these synthetic worlds, a simple approach is done at an increasingly massive scale – geometric surfaces are described in 3 dimensional space. Those surfaces are decorated with arrays of pixels that are perspectively transformed by the surface and the rendered view of the world. The other main characteristic of those surfaces is obtained through the simulation of lighting effects on those surfaces – the

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<sup>6</sup> During 90's if you were creating interactive, 3d graphic environments, it was called "virtual reality". Now it is thought about more as computer gaming environments. The technologies having migrated to the masses, but with a transformed view of their implications.

techniques ranging from complete fakery (shading techniques such as Phong or Lambert crassly break lighting down into characteristics such as specular, diffuse and ambient characteristics) or in relatively sophisticated simulations such as mapping photonic interactions with material properties<sup>7</sup>.

These polygonal surfaces are almost always carefully constructed to simulate the surface of some consistent and coherent objects. As they are built, particular tricks are employed that utilize a mix of characteristics that can be obtained from the object geometric specifications and the objects texture and material definitions to create the final effect. However, using these constructive principles directly and not simply in their illusionistic capacity can provide for a level of engagement that brings in more than one level of meaning specification. As in any medium, expressive strategies that include artifacts of mediums functional form bring into a works discursive range concerns about the history of the medium – how it has been utilized in other expressions and the general representational mechanisms that it creates. Simply acknowledging that one is working with a set of expressive tools that have applicability elsewhere brings a cultural contextualization into ones work.

These faceted forms of spatial pixel maps are readymade containers for collagist strategies. By making more conscious engagements of the combination of spatial form and surface description – one can multiplex these object definitions to create an intermix of referants to occupy their space. Spatial collage overtly brings at least two elements into radical consideration with each other. It isn't just the surface symbols that are then collided, but it is the structures at work beneath them – what is actually brought together is all of the open-ended forms that are represented by the collaged elements. Collaged elements operate at even more of the level of sign then do the elements that work so hard to sit in a normative representational universe. Now there is no reason that the un-collaged can't and won't operate at a meta-syntactic level, it is just that they often don't – sometimes a pipe is just a pipe – and often in our banal world of continuous media consumption, the relationship of signifier to signified is just not as interesting as many of our old school post-modernists would have us believe. Or it is perhaps that as an artist – the range in which we can work that extends far beyond the normative strategies of consumer media, allowing us a density of expression in the basic gestures of our work, that make these types of strategies effective.

### **Assemblage – a spatial attitude**

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<sup>7</sup> "Photon Mapping on Programmable Graphics Hardware"  
Timothy J. Purcell, Craig Donner, Mike Cammarano, Henrik Wann Jensen, and Pat Hanrahan  
Symposium on Graphics Hardware 2003, San Diego, July 2003

Just as we can build the components of objects by considering the meaning of strategies we undertake for each piece that comes together – the totality of these objects creates a whole that provides a reflexive context onto each element in-situ.

Again we can find ourselves working against normative engagements of these media which strive to create illusionistic and banally consistent worlds. Even if the worlds have large transformations that occur in them, they will have to do so in a seamless and narratively simple cohesiveness. It is not necessarily simple to do this with computer media, in fact it is very difficult, thus doing so gives a work a certain virtuosity (motion pictures that pull off a blending of “visual effects” with live actors and sets often gain accolades of critics and the movie industry). However, I would ask to what meaningful ends did this technical virtuosity achieve? It seems to me that these desires are ways to replace a responsibility for a meaningful engagement with an expressive form and substitute the external reason of believability for engaging an expressive strategy.

Using the tool as an artist is the continuous reconciliation of working from the inside out with the desires of the outside in. In doing so, the acknowledgement and embracing of incongruities tells more (and in a more efficient way) than all of the effort of seamless blending. The “making of” features of effects laden films on DVD are always more interesting than the obvious film itself. By laying out the incongruous realms of computer effects, models, live actors and possibly other forms of footage (such as historical or documentary), we see the play of the narrative erupting through multiple layers of human expression – it is completely unnecessary to obliterate their individual character through the process tellingly called “conforming”.

### Montage

Much of these ideas about spatial strategy owe much of their specific usage in a work to the manner in which filmic montage has been theorized. Not that I think that there is as reductive an approach to meaning and effect that early Eisensteinian Montage theory tried to derive, but simply understanding that radical temporal juxtapositions will create a vocabulary of meaning. For computer game/virtual reality forms, this has become significantly utilized of late. However, I find that its general use is simplistic and limiting, trying to extend the moronic first-person shooter into a more “cinematic” look.

The real opportunity that we have with these types of worlds goes beyond a montage strategy that employs the most flexible camera a cinematographer has ever had (and an infinite number of them). We have a situation where world and camera and subject are completely interchangeable and inter-mutable. We can shift subjectivity, object structure and world organization as simply as we can cut from camera 1 to camera 2.

Montage is no longer just a strategy for the camera and the editor – it is now a strategy for, and between, the actor, the set, the score, the costume, the lighting, etc....

This of course is a follow up to the translational capacity of the computer. All of its processes are undertaken as completely valueless. It matters in no way at all that something is a way in which time is edited and another strategy is a way space is defined.

As artists who engage in a culturally critical practice we should purposefully “mis” apply these codified forms as one of our expressive strategies. We need to script our scenes on the basis of lighting algorithms and derive our edits on the basis of sound filter synthesis. By applying these strategies across domains, value systems become apparent and revealed in way that transcends their usage “as intended”.

This is important work to do. It is important beyond the expressive boundaries of a single work at a specific time. It is important because it can provoke us to examine our own lived experiences – to look at the ways in which our world is becoming increasingly mediated and directed by algorithmic processes. We need to be able to read those processes in order to survive. We need to be able to hack them and jam them at times – in order to survive. We need to continuously allow our own humanity to transcend their dictates as they become increasingly interesting. At some point they may become more interesting than our humanity and then perhaps our job will be done.

### Scalable City

A current set of works that utilizes this aesthetic sensibility is called *The Scalable City*.



Figure 1. Still from from Scalable City animation

**The Scalable City** is a set of projects that explore the externalization of algorithmic approaches to urbanization that intersect with geographic, political, economic and aesthetic zones of conflict. Version 0.7a of the Scalable City is a multi-media exhibition that utilizes multiple manifestations of different components of the larger Scalable City project with landscape demarcation, suburbanization and domicile transformations. From each of the elements of the given situation, procedural basis are distilled from a given form. The parameters of these procedures are then put into an operative mode – moving them from their familiar basis to highly exaggerated extremes of patterns and juxtapositions. Through these processes, which reveal the procedural basis of the development of cultural forms, the mechanistic processes of social formation are highlighted. The forum for this version of the work is the US/Mexican border where collisions of cultural forms, political structures, economies and landscape are distinctly overt

One of the profound transformations that we are undertaking is the transformation of physical reality by the operations and methodologies that we have developed through electronic media. Media has engendered a literacy and facility for understanding relationships between elements that inscribes itself upon how we construct, experience and desire physical relationships. Now, through technologies such as 3D computer games, virtual reality, computer aided design, computer aided manufacturing and rapid prototyping, we are further blurring the lines and crossing the semantics of physical space operation and media space operation.

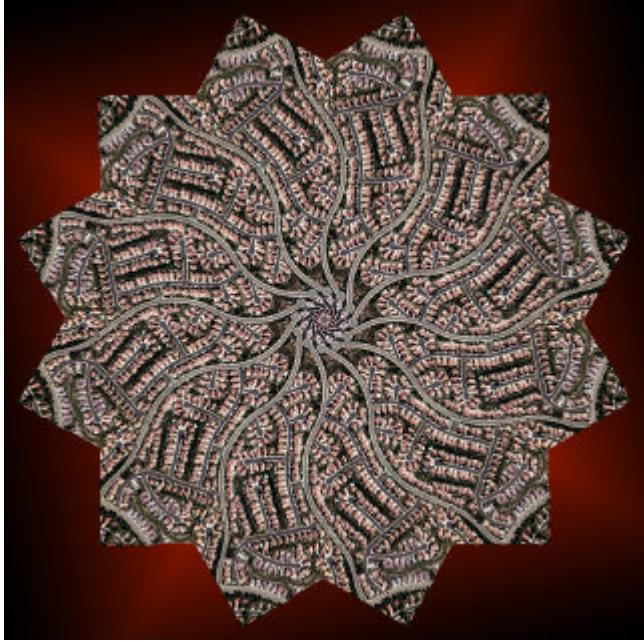


Figure 2. Still from Scalable City animation

### Borders and Cities

The US/Mexico border is of particular interest due to my geographic proximity and its diffuse effects throughout my daily life, situated behind a veneer of American isolationist normalcy that masks a complete interdependence on the border dynamics, whose expression within the dominant discourse are the occasional bursts of inconvenience, disregard or disdain.

My engagement with the construction of a digital city of refuse, celebrates the actuality of living within the situation of in-betweenness that is the condition of the border and our culture at large - living somewhere between the physical and the virtual.

Looking at the architectural forms that result from occupying these zones, acts of survival are undertaken in ways that engage the situation of cross-cultural collage. The act of surviving here leaves an architectural map of the tensions of economies, culture, value systems and landscape which are most evident at the edges. The city itself becomes one that is built with its edges as its primary element, and it reveals its underlying desires through its encoded processes.

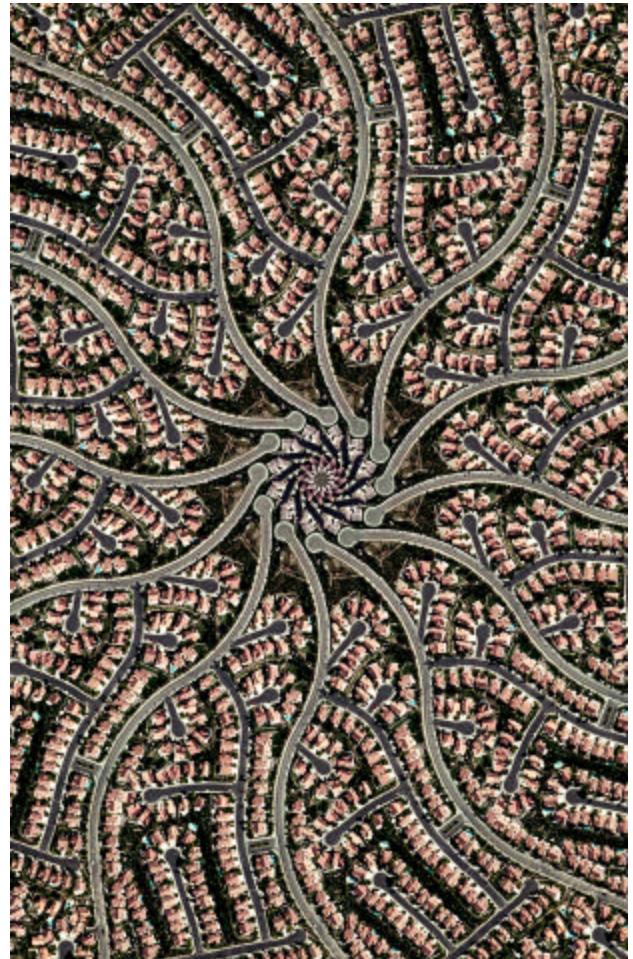


Figure 3. Still from Scalable City animation

## **Elements**

This version of the Scalable City has elements that each address an aspect of this situation, from different scale relationships. The “map” level looks at the way in which the lived environment is mapped onto the geographic environment. Strategies of occupation construct pathways for mobilizing and controlling access. Extrapolating the methodology of these tactics, suggests a maximum engagement of suburban desire into a messy social and physical landscape. This expression is transformed into the highly patterned forms that seem to be a nostalgic remnant.

The final act is the demarcated zone of the maze that these elements construct built out of the types of fences, walls, and barriers that articulate these forms.

## **Environment**

The first manifestation of this project is a three channel video installation – which can be shown in a smaller – screen based set up, or in more architecturally externalized form. Several dozen computer graphic clips (about a half hour worth if viewed linearly) are played across the three displays in various orders, under procedural control of a master program. When the project is shown in a full

projected mode, each display is on a different image plane – floor, table, and wall. As the different graphic images are displayed into the different planes, they shift relationships between figure and ground. This compositional strategy for the installation environment mirrors the strategies that are used for composition with the clips themselves.

## **References**

- [1] "Real Art and Virtual Reality" by Sheldon Brown, ACM SIGGRAPH Computer Graphics, Volume 31, Number 4, November 1997.
- [2] [crc.ca.ucsd.edu/sheldon](http://crc.ca.ucsd.edu/sheldon)
- [3] The Computer, from Pascal to von Neumann by Herman H. Goldstine Princeton University Press, 1972
- [4] Federal Regulation of the Radio & Television Broadcast Industry in the United States: 1927 - 1959  
by Robert S. McMahon, Arno Pr; Reprint edition (January 1980).
- [5] "Photon Mapping on Programmable Graphics Hardware"  
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