Why Fi? 4K Fidelity in the Scalable City

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The Scalable City is a set of projects that work across four mediating systems of representation. No one of these systems is the single, canonical "home" of the work, but each sets into play methods of viewership that are traditionally associated with other forms. The different ontologies of this work are in part spurred on by the techno-cultural developments at one end of an axis (we might call it the *gamic*) which suggests new ways of receiving the forms at the other end of an axis of mediating systems. Along this axis, the project moves from games to *machinima*, to animations to movies to prints to sculptures. The purposeful operation of the project across all of these modes is meant to engage bi-directional epistemic strategies. Bringing the cinematic, the spatial and the pictorial to the table for understanding the game forms, and taking the new viewer that the gamic constructs back into the experiential fields of the other mediations.

   One way in which this particularly occurs is in relationship to the idea of "fidelity". The cinematic modes of the project addresses the issue of "fidelity" as an issue of resolution and visual scale in the 4K format: that is, a moving image at the most recent digital film standard scale of 4000 x 2000 pixels. The spatial resolution of this form gives the cinematic an uncanny lack of pictorial display artifacts. This enables the work to tactically amplify the revelation of its constituent processes for aesthetic as well as rhetorical ends. The 4K cinema format is another moment in the ongoing negotiation between the realms of the fictive and the real, its lack of apparent pictorial artifact removing another veil of mediation. However, it operates within a culture that has a well-developed history of cinematic perception. This work recognizes that there is enough of a transformation of the image in this configuration that it causes the viewer to re-negotiate their own spectatorship, to re-calibrate the cinematic stance. This activates the viewer in many of the same ways that the game installation and print strategies do – to make them self-conscious of their own roles as viewer in the work as a bridge to an awareness of their role as actor in the socio-cultural processes that the work is invoking.

   Since the development of perspective in painting, new forms of visual media have troubled the distinctions between the represented and the representational. The moments when these new forms emerge onto the cultural scene provoke anticipation, imagination and anxiety. *The Scalable City* trades upon these moments across the digital image, virtual reality (VR) and computer games. The 4K cinema piece in particular viscerally invokes the cinematic dilemma in a way that has mostly been engaged behind the screen. In cinema, the renegotiation of the fictive and the real has been rampant in post-production effects which utilize computer graphic techniques to create more fantastic realms driven by an aesthetic of seamlessness, within a logical time and space structure drawn from contemporary experience. Now, the image plane of the screen itself becomes a site for this transformation with the extraordinary resolution of the 4K image. The elimination of the apparent artifacts of the medium removes many of the signs by which we demarcate between the mythic and the real. This gives us a destabilizing cultural moment where we once again have to renegotiate the differentiation of these realms - or the interrelationship of the two. It is this destabilization that provides for a quality of "immersion" that 4K cinema has for the moment. This immersive character is an attribute that gathered some importance as a quality of virtual reality forms. Immersion describes a situation where mediation sufficiently engulfs the attention of the viewer so as to confuse the relationship between the mediated and the real. However, our ability to devise complex relationships to the ongoing developments of mediation has developed as quickly as the developments of mediation itself. VR failed to become an immersive media, while it provided for affordances that surround users with responsive computer graphic environments. Technically sophisticate, but also *gamicly* complex video games are arguably more immersive than VR environments: player-viewers spend as much as fifty, or even hundreds of hours playing a complex computer game and become immersed in the combination of complex game logic, expressed by relatively sophisticated computer graphics, even if the screen itself doesn't completely fill their field of view. However, when people first experienced VR environments and their represented computer graphic forms, they produced a speculative fantasy about what mediation might become. This moment of anticipation, anxiety and speculation provides fresh eyes to the

possibilities of a new form of mediation.   This moment now exists with 4K cinema. As we create our initial forays into this pixel-dense territory, our renegotiation with the viewer allows us to see the screen as a new space. By replaying the game elements of the Scalable City in this super-cinema format, the dazzle of technological novelty can be buffered by our general cinematic literacy, such that the gestures of the artwork can have an apparency that may not be as visible in their simultaneous play of the game form.

Gamic representation depends heavily on its technological base. This contingency is more radical than that of most other contemporary cultural forms, as its fundamental visual attributes are the direct result of an ongoing complex of thousands of human years of engineering which are poured each month into the hierarchical system of game engines, graphic libraries, programming languages, and computer hardware technologies. These technologies develop rapidly due to both the internal developments within any given element in this chain (e.g., new graphics libraries), and developments that respond to changes in other levels of the hierarchy (e.g., changes to CPU technology from a serial processor to parallel processors.) Consequently, the visual aspects have been developing rapidly. In the last decade, video games have developed from the utilization of 2-dimensional space to that of post-Albertian 3-dimensional perspectival representation. In the last five years, games have moved from home bound systems to network based multi-users. In the last two years, the visual fidelity has improved from somewhat less than sub-NTSC video quality to high definition 1080p imagery.

Yet with all of this attention upon the technical development of the game image form, very little attention is paid to a critical viewing of how these forms are used to create a representation. It is as if many of those trained in the analysis and nuance of the visually challenging and elusive forms of contemporary art are befuddled by interactive computer graphics. Perhaps this confusion rests upon not knowing where to direct critical attention. The aforementioned technological dependency makes gestures within this space more contingent on material constraints than those in the space of painting. However, criticism in contemporary visual art (painting, sculpture, photography, film and video) has been well able to engage the discourse of the cultural and historical contingencies these forms. Video games have not so much defied or resisted much of this type of analysis, as been ignored by it; instead focus has been aimed at their narrative forms and social operations. The popularity of games with such activities as first person shooters; the attribution of anti-social traits to the video game player; the video game as a manifestation (or outcome of, or expression of) the male gaze –have been a target of a large amount of video game criticism.

But of course, this might just be that this is the realm of the popular. Popular video games wallow in these issues, just as popular video (i.e., television) wallows in the banal, and popular movies wallow in the obvious and well worn. It is the "artists" who bring attention to the complexities of these forms. But here as well, much of the work that involves games as art, tend to look at the egregious narrative areas or social outcomes. This tendency has much to do with the ways in which many artists have attempted to work with the form –as aftermarket remodelers and customizers of existing games. A few games have been made (such as *Unreal*) in which the ability to substitute user created assets ("mods," short for modifications) for the given game assets is provided. A host of mainstream games have been made with this approach (e.g., *Counterstrike*, a user-made mod derived from the commercial title *Half-Life*), and a number of artists have utilized this approach as well. Other re-writings of game texts take the opposite approach – using the assets of games and moving them into a decontextualized form. Both of these approaches subvert an interrelationship between the visual and the structural in computer games. The strategies of either mapping a new discourse into the framework of an existing one (as in mods) or the isolation of visual components, do provide an opportunity to expose and foreground the frameworks and forms of the original works. However, these strategies do not provide for a consideration of the form taken on its own synthetic complexity.

The Scalable City has developed as a project with an overriding and long term goal of developing a persistent, multi-user online world. At the outset, it was conceived as a development spanning several years. This is about the same time frame that a full video game project takes to create, and for the same reasons: it takes a period of managed labor-time to create programs with the complexity of a contemporary video game. In addition, *The Scalable City* project has had many objectives in its development. Of ongoing interest are technological developments provoked by the artistic interests which motivated the work initially. This puts aspects of the project into the realm of computer science research, and in fact the project gains most of its financial support from this research activity.   The

time frame has also meant that the project would iteratively develop its aesthetic and conceptual forms, and do so through the ongoing completion of incremental output and derivative forms. At each stage, the interaction of viewers' perceptions, the qualities of the assets and the operations of the algorithms have been the cruxes of the work.

The initial material output of the project was a series of digital prints. Through these prints, some of the project's aesthetic vocabulary was developed, as well as the establishment of complicated roles for the viewer in the work, for the prints connote an interactive experience. This interactivity is achieved by the work provoking the viewer to shift their spatial frames of reference to the print. The prints have a deliberate compositional resistance to the perspectivist picture-plane. One reason for this is the origin of these prints in satellite photo imagery. These horizonless, subjectless images are neither portraits nor landscapes in the western depictive tradition. They aren't windows on a world, but an omniscient view destabilized from its axis. This movement of the image of the ground beneath our feet to the vertical space of the wall is a vertiginous spatial reconstruction for the viewer. This is accompanied by the varying degrees of abstraction and patterned exaggerations of the image content. The source imagery is transformed by algorithmic techniques that are simple and apparent, but which quickly brings attention to the uncanny cultural/natural collisions that are occurring in the original. The composition collapses these around a center and cuts them off at the frame edge. This technique engulfs the eye, occupying the central visual field with the edges trailing off to a suggested infinity. At a distance in which one can take in the whole image is a level of detail of patterned repetition of the community. However, the community is an expression of many levels of the socio-cultural, and one can be drawn further into these details in the image, where the viewer can consider the condition of the individual in this speculative organization. This gesture physically moves the viewer closer to the print, immersing their vision further into the field, building on the destabilizing gestures that necessitate their construction as a more spatially sophisticated user. The prints require a fidelity in which the viewer is able to have this multiplicity of spatial relationships. The prints are also suggestive of a multiplicity of outcomes. They are but one instantiation of an algorithmic system.

Playing out the possibilities of these first algorithms produces animations. The prints become moments of the animations which have particular resonance. The initial animations do not provoke the same spatial interaction of the prints, instead provoking time-motion perception. The prints are however far more interactive than the animations. The prints allow for the viewer to navigate the transformation of the image through their own body movements; the animations have a deliberate temporal play, with a script that defies more conventional media time. Change is at times nearly imperceptible and at other times seemingly extremely rapid. The imagery shifts from a degree of abstraction which would make Greenburg envious, to the strangely familiar satellite imagery.

After these procedural animations, the algorithms are now put into play in a simulated new space: the field of the game space. However, the development process itself has to catch up with the interests of the work, and the cinematic becomes a more viable medium for development than the interactive game. Small movies are produced that utilize the common databases and algorithms. The movies are rendered offline, removing the time pressures of the interactive. The linear structure narrates the interrelationship of data and algorithm, which has simultaneity in the game environment where it is unpacked by varieties of actions.

Soon, the computations are optimized and the real-time environment is created. This real-time environment is installed in museums (with varieties of approaches based on the qualities of local sites). The installation form utilizes the viewer as an actor first in the architectural space of the physical site, and then as participant/performer of the interactive graphic environment. The presentation is done with a high degree of visual spectacle – multiple projections, sometimes with stereography, and a single user interface. The form is a mash-up of media installation and virtual reality game environment. The gamic aspects of it provoke the interaction with a user, but some of the expected outcomes of game engagements are not a part of the work: there is no single goal or end, there is no score, there is no competition. The interactivity is an extension of the visual apparatus of the viewer. It brings along the temporal extensions to the image that the cinematic provides, while allowing for spatial extensions that have previously been the domain of the architectural and the sculptural. The participant/performer becomes an element of the installation, filling the role of any user in the system of the piece and implicating all of us as actors in its dramas.

The visual elements of the work are distortions of representations. Photographs are assembled in ersatz reconstructions of their original forms of cars and houses. Landscapes are re-formed by imagistic cut and paste processes, and thickets of road systems spread into the world driven by plant-growing logic.

Unpacking these visual forms and their operations is key to the meaning-making of the work. The simulated physical forces of gravity and wind and the simulated behaviors of plant and crystalline growth drive the interaction of the cultural symbols. Negotiating back and forth between the systems of the cultural and the natural, with the capabilities and the inadequacies of the simulation systems at work, attests to the power and failures of our understanding and imagination of the complex environments that we inhabit.

The game environment creates a visceral experience of living in this conundrum, but readings of this experience can be complicated by some of the contingencies mentioned above. Culturally we are in the nascent stage in our understanding of how the gamic operates. We are often in a position of simply trying to have operational functionality with the gamic (such operational functionality is the primary point of most games.) And as the development processes are still limited by the technical affordances of the system, it may be unclear to the viewer how much of the aesthetic is simply the result of those limitations.

With these concerns in mind, the forms and algorithms of the game and have been turned back into the production of a cinematic work. This has become the *Scalable City – New Trailer*, produced at the 4K, 4000 x 2000 pixels, resolution. The interest in this cinematic format for this project is multifold – first it is the aesthetic possibilities that this new format provides, but it is also an interest in the implications of the transformation of cinema to a complete digital end-to-end process.

First, the aesthetics of this image, as discussed above, with their lack of pixel or grain artifacts, and the nature of the projectors color and contrast range and consistency across the image plane, give an uncanny clarity. This visual field can be compositionally exploited to provide for numerous shifts in attention strategies. Viewers can be moved deeply into the image, or presented with multiple focal points which flatten the screen, or moved spatially with no detail ever breaking down into its pictorial construction.

For *The Scalable City* this has provided for an attenuated view on the visual elements of the work. The house pieces are clearly seen as an architectural origami – distorted and folded photographs whose ability to hold up as believable structures attests to their symbolic operations. The distorted cars, caught up in tornados which organize these neighborhoods, resonate as material consumption, torn from the polygonal earth as they reorder it for their own operation on their way to becoming permanent fixtures in the altered atmosphere.

Secondly, there are the implications of this 4K form for the fate of cinema. Here at last is a digital presentation format for cinema that has desirable visual advantages over film. With a slight lag in the development of adequate digital cinema cameras of the same format, cinema is poised to become a complete digital production and dissemination form. Image quality concerns have allowed it to resist this until recently, and several aspects of the movie industry have also slowed the transition (including those concerned with film technology and maintaining control over intellectual property.) The movie industry will not move to a complete digital stream without compelling economic advantages, which in part are based on the visual possibilities of the image experience. With the advent of 4K, the industry is now prompted to participate in the instability of a digital medium. This transition will provide for many new possibilities for how the cinematic is produced, distributed and experienced. 4K will quickly become 8K then 16K, and so forth. Stereography will be far better and will return (and possibly go away again.) Movies might be wholly or partially computed in real time, as *machinima* now suggests. And many other speculative changes will be attempted in a more dynamic cinematic environment. Overall, the forms of cinema will have the same technical instability and digital mutability as other forms of digital media, such as the web and computer games. With this, each cinematic experience may have to spend part of their time in "training" their viewer. Just as games or websites are layered experiences, increasing in complexity as users become more fluent, the cinematic may need to become more semantically overt to bring viewers along into new operational novelties of the new cinema.

The 4K movie form of *The Scalable City* posits a relationship between games and cinema in its mining of game assets and dynamics. With the signature aesthetic forms of the game (low polygonal counts), foregrounded by the visual clarity of the 4K image, our own performance within the simulation vocabulary of game world is now empathically engaged in this cinematic replay. The grander cinematic scale gives poignancy to a world transformed by the articulation of all of its algorithmic desires. Each element is rearranged in decorative patterns for the pleasure of being re-consumed by an omniscient gaze, from which the whole process began. The re-mediating strategies of *The Scalable City* replay our own culture's compulsion to rework itself, to convert the outcomes of its own desiring processes as fodder for re-initiating the chain of expression and consumption.