Landscape of the Mind

Richard Perron and Deron Miller
University of Manitoba

Reality and Virtual Reality.

The focus of this article is the exploration of landscape and the question of representation, more specifically how landscape principles can be represented through computation. It is a quest for essential qualities, through an application of philosophical questioning, and a response to a human perception of reality. Reality, as an invention of the human mind, is often thought of as a set of accepted conventions and constructs. Such a reality has an inherent dependency upon cognition where spatial and temporal principles may be defined within the natural and built environment, and further embraced within a cultural context. However, there also exist rules or relations that are neither invented nor formulated by the participants understanding. In effect these relations may not have been effectively articulated, a result perhaps of unfamiliar cues. Therefore, to the participant, these relations reside in the realm of the unknown or even the mystic. The aesthetic often resides in the realm of the mystic. The discovery of the aesthetic is often an experience that comes from encountering physical and essential beauty where it has been produced through unconscious relations, perceived, yet transcending human understanding. The aspects of space and time, spatial and temporal properties and relations of things and events, are generally accepted conventions. Yet, the existence of a time order, is often not perceived. An understanding of spatial temporal properties may involve a temporal detachment from convention, allowing the release of previously unknown patterns and relations. Virtual realities are well constructed simulations of our environments, yet they may lack the embedded essential qualities of place. Virtual reality should transcend human perception and traditional modes of understanding, and most importantly our limited notions of the temporal nature of our environment. A desire to reach beyond the limits of perceived time order, may take us beyond existing sets of cultural values, and lead to the realization of new spatial/temporal conventions with the assistance of the computer.

Perception and Reality.

The computer as a tool, allows for the representation and exploration of a perceived or apparent reality. The representation is an approximation of reality, or a virtual reality. How an individual perceives reality in terms of visual experience must first be explored in order to understand the concept, existence and implications of a virtual reality through computer image creation. Visual experience of figure and object existing within the scope of an individuals view, provide them with the opportunity to respond with their own personal interpretation of reality. Does this image of reality, which resides as a cognitive map in the minds-eye, simulate actual reality, abstract reality, or is it reality?

The individuals response to an environment depends on “how one casts his gaze around the world and on his purposes i.e. on the information that he seeks.” The participant within the environment is consciously and subconsciously experiencing the reality of place, according to personal experience as well as to an established cultural reality. Cultural reality is a product of spatial and temporal experience procured through invention and convention of a culturally initiated value system. Ralph suggests “this occurs because we experience more
or less the same objects and activities and because we have been taught to look for certain qualities of place emphasized by our cultural group.\textsuperscript{2}

Active visual and perceptual searching of objects in space cannot be fully established as actual reality in a setting involving multiple layers of unrelated items. Hochberg states that "we can only remember a small number of unrelated items in immediate memory - somewhere in the neighborhood of five to seven items. In order to remember a larger number of items they must be committed to more permanent storage in an encoded form (i.e., in an abstracted, reduced, or symbolic form).\textsuperscript{3} In order to understand the reality of place, a succession of observations must be undertaken by the participant. The participant when reaching maximum storage potential of the immediate memory, must draw on recollection or memory of previous visualized objects, within the permanent storage, to complete the scene (Figure A). The information in the permanent storage is encoded or symbolized according to learned familiarities of spatial experience, "thus the study of landscape visualization concerns not only the reality of landscape, but also the images derived as repositories of place meaning formed and interpreted in the mind".\textsuperscript{4} Learned spatial familiarities are as well a construct of personal experience, culture and context. Developed as an infrastructure from early childhood it is utilized as a framework for organizing drawing on the collective memory. The collective memory is stimulated by the familiar, "the mind becomes biased in favour of the familiar and the person becomes predisposed to see what experience, stored in memory, suggests ought to be seen."\textsuperscript{5} Therefore reality exists within the mind as a mixture of learned, contextual, and culturally encoded collective memory, as well as the personal interpretation associated with the visual images captured in the present, immediate memory (Figure B).

\section*{Memory, the Aesthetic, and Imitation.}

Encoded within the memory are the perceptions of beauty and the aesthetic, experienced, however not defined, "beauty in the last analysis remains a thing superior to our intellect."\textsuperscript{6} The formal understanding of beauty can be related to the temporal construction of familiaris. The recognition of beauty is a twofold experience both a subjective (inner) and objective (outer) sense. According to Winckelmann as stated by Vidler, "it is the outer sense that guides the accurate eye, distinguishes form and color and meticulously controls the inspection of the work. The inner sense, on the other hand is the sensitive agent, purified of all other purposes for the sake of beauty... it is the seat of emotion... which consequently affects our perception uniformly, guides it gently."\textsuperscript{7} The object is then judged according to the preconceived notion of beauty encoded in the collective memory, as well as the subconscious emotional response, stimulated by the visual scan. The assessment of beauty, as in reality, encompasses learned cultural values and a solicited emotional response, as a result of visual stimulation. In architecture the need to understand, and the desire for the creation of aesthetic beauty, results in the investigation of properties intrinsic to the physical world according to a structure of cultural ideals. Historically, this is illustrated in the writings of various philosophers such as Aristotle, Plato and Plotinus. In terms of art, or for our purposes the image, "their views, like those of contemporary theorists, are concerned with the function of art in its cultural context."\textsuperscript{8} The discovery of the essential qualities of an object was the primary goal, literal imitation could not present an accurate picture of the "perfect idea of an object, that is the ideal representation of an object, rather than attempt to imitate a specific physical object in the physical world."\textsuperscript{9} Their ideal was related to cultural beliefs, natural geometry and the ideal proportion, as well as a relationship existing between "beauty, truth and goodness."\textsuperscript{10} The conceptual importance of this is the established essence with regard to cultural interpretation and values. The imitation, or capture of essence implicit in the physical world is integral to the study of landscape representation in the computer environment.

\section*{Simulation and Place.}

To understand the implications of reality simulation in the computer environment, (with regards to the physical environment), we must
address the aspect of place and the "essential." That is, the essential qualities of space that provide a location with character, beyond, but intrinsic to the physical relation of objects. To capture the essence of place simulation must stimulate the collective memory and conjure relations beyond the representation itself (Figure C). Hinchberg states that the image has the potential to embody "stimulus features to which the visual system responds in the same manner as it does to stimulus features frequently encountered in the normal (non-pictorial) environment." 11 This idea is primary to computer simulation. Simulation must respond to certain essential qualities of physical space, in order to perceptually simulate reality. The essential qualities are the entities which transform space, into "place." The idea of place within the physical environment can be approached from a multitude of disciplinary viewpoints. Place will be discussed not as geographical location but as the physical spatial provision of setting, as a context for place. The question then arises how does one simulate place within the computer environment. Christian Norberg-Shultes expresses two psychological functions, *orientation and identification." 12 The former being place as physical location and the latter involving meaning and place identity. Physical location and identity combine to produce place, "places are centers of value, they attract or repel in finely shaded degrees. To attend them is to momentarily know their reality and value." 13 Recognition, and therefore simulation, of place, requires as suggested by the terms "attend" and "momentarily" aspects of physical participation as well as time, in order to acknowledge a reality of place. The term 'value' suggests cultural reality or inner /outer sense evaluation drawing on the infrastructure of the familiar, to establish meaning and identity within the spatial context. Simulation, to extend beyond only spatial representation of objects, must contain the expression of movement and time combined with meaning and identity manifested through spatial articulation, to represent place. Can simulation of essence within the machine, result in a depiction of actual reality? Or, should we look to abstraction as a means for representation of reality (Figure D)?

Image of Reality: Simulation or Abstraction.

The term abstraction is defined as "a quality of a thing that has been separated from the thing itself." 14 Conceptually, it could be suggested that this is the manner in which we perceive the environment as reality. When dealing with abstraction, capturing the essence of an object is the primary objective. Abstraction unlike simulation does not pose as reality. In a sense, abstraction investigates integral quality or character through non-literal representation. This is important for the representation of place. Abstraction presents the opportunity to construct conceptual models of the essential qualities which create place, through image (Figure E). For the designer this allows the computer to be utilized as an effective tool of representation beyond the limits of the two dimensional video display unit. In attempting the simulation of reality the observer is presented with an image, unless the observer is free to "move about, use both eyes and observe rich changing scenes." 15 Perception of reality through visual stimulation is inoperable. As stated, when experiencing objects in space, reality exists within the mind as a mixture of learned, contextual, and culturally encoded collective memory, as well as personal interpretation associated with the visual images captured in the present, immediate memory. The encoded memory is an abstraction of the experienced object represented as symbol in the collective memory. If the collective memory could be stimulated, in the environment of the machine (through the conceptual manipulation of essential abstraction) place reality could exist as a stimulation of similarly occurring represented cues. The transformation of essence as concept, captured within the computer environment as abstraction, could then be related to the observer. Related as perceptual information to stimulate, through conscious and subconscious representation (similar to the physical world) the idea of reality. The transference of place concept through essential abstraction can potentially manifest both the static and the dynamic aspects of the physical world through a computer generated image. Simulation of reality, however, is limited to a greater extent in the representation of reality and often results in hyper-real environments lacking basic human perceptual stimuli. Blake suggests that simulation of the physical environment requires
"computer generated environments, where the viewer is immersed in a scene and where there is freedom to move about,"\textsuperscript{16} to recreate the environment. Simulation, thus seems to prescribe to the theoretical premise of realism which involves literal translation of the physical environment and scientific correspondence with physical reality. Abstraction, however, seems to prescribe more to idealism, the avoidance of literal representation of physical reality, and the quest for the ideal (Figure 7).

Reality and the Participant.

Reality and virtual reality share one common aspect: the participant. The perceptual participant is the key to the success or failure of the representation. The image of reality exists, not as a static, but a dynamic entity, involving time and motion coupled with the culturally established familiar. If we accept recent theoretical postulation, the participant in contemporary society is a product of post modern culture. The post modern participant is "the development of a society that has experienced a technological transformation of the social world where electronic artifacts such as computers, television and video constitute and symbolize the radical alteration of our cultures time and spatial consciousness."\textsuperscript{17} Technology has produced a new spatial consciousness and spawned the development of scientific generations of suggested "natural" phenomena such as wind patterns, chaos theory and fractal landscapes. These theories present images said to correspond with reality or present a simulation of reality. The fractal landscape, as a product of technological advancement of post modern culture , "for the sake of science, is indissolubly based on the use of computers."\textsuperscript{18} Although the fractal landscape "looks like" or spatially simulates landscape, it does not represent place. Mandelbrot suggests an informal definition of the fractal environment, he states that:

Fractals are geometric shapes that are equally complex in their details as in their overall form. That is, if a piece of a fractal is suitably magnified to become of the same size as the whole, it should look like the whole, either exactly, or perhaps only after a slight limited deformation.\textsuperscript{19}

This definition in itself, although informal, denies itself and its application in the representation of reality within the physical world which we exist. In its definition it denies a basic element necessary to the representation of reality, the element of scale. If we were able to magnify a portion of the whole (as suggested by Mandelbrot) within a given spatial setting in the physical environment it would be equally as complex in its detail, however it would not resemble the whole, but exist as an element integral to its overall composition. The fractal ignores ecology. The understanding of the science of ecology is integral to human perception of the reality of nature. At best the fractal is an abstraction or an approximation of reality, it lacks the essential qualities of diversity and complexity to accurately simulate reality. Virtual reality suggests reality, through, if nothing else, its wording. How can one represent reality, by denying factors basic to its composition in reality? Max Black states that, "a picture may 'look like' its subject, but the problem is to see whether we can say anything useful about what 'looking like' amounts to.\textsuperscript{20} Fractal generation results in an image that relies visually on its texture for representation and stimulation of the participant, a product of realism. Realism is once again the element of scale that seems to be lost within the framework of fractal generation. The fractal generation is the image of technology, mathematically pure, created by technology rather than reality. The computer is a powerful tool that can be, and should be, utilized as an abstraction tool to visualize essence rather than literally translate it. It allows for the exploration of essential qualities of the physical world through the manipulation of scale; reality exists at all scales within the physical world. Magnification of elements existing in the composition of reality, within the physical world, and their relation to our (human) perceived reality may represent a virtual reality. A virtual reality based on essential abstraction and reorganization of the components of perceived reality. Hulick suggests that digital imagery should, "function as an extension of the mind" and "concentrate on the development of the imagination as a type of creative
epistemology. She also states that "we need to see what unique contributions it (the computer) can make to the subjective and symbolic aspects of human understanding." Computer stimulation of the participant should be based on essential properties of the physical world, manifested through computer abstraction, to extend the limits of human understanding of reality.

Abstraction and the Physical Environment.

The physical environment is a complex entity and therefore it is not possible to explore all aspects involved in its composition. Essential abstraction should deal with the representation of aspects integral to the physical world to extend our understanding of reality. As stated, abstraction is the quality of a thing that has been separated from the thing itself. A conceptual process through image creation within the computer should abstract the integral aspects of the physical world. The computer-aided process should demonstrate the potential for abstraction in the representation of reality and virtual reality of the physical world. Through abstraction the unique potential of the computer must assist in the release of previously unknown patterns and relations which exist as reality beyond conventional human understanding and perception, within the physical world.

Abstraction and Image.

Towards a means of landscape conceptualization. The use of the computer as a means of landscape design conceptualization has yet to be effectively demonstrated. The following is a brief description of how one might begin to address landscape abstraction in accordance with some of the principles described above. The image process deals with the abstraction of essence through spatial articulation and magnification of a whole, similar to the process of magnification suggested by Mandelbrot in the informal definition of the fractal environment. The creation of the image (the whole) is constructed entirely within the environment of the computer as an essential abstraction of reality (Figure G). The computer as technological medium (raster based) through its translation functions serves as an extension of the mind, to manifest the abstraction and offer the representation as an expression of reality. A conceptual diagram will be presented as a computer generated image (representing through abstraction) the attributes integral to the physical world involving scale (Figure H). Through magnification of an image created within the environment of the machine we are paralleling conceptual aspects of the physical world. The physical world is composed of various layers of reality dependent upon scale for its perception and understanding. Spatial cognition exists relative to the scale of the environment at which the participant interacts. Through abstraction and magnification in the computer environment a portion of the whole could be enlarged to the size of the whole itself. The magnified detail is intrinsic to the whole as a part of the overall composition. However, it carries with it its own spatial characteristics unique to itself, in terms of light, color, texture and relationship of integral elements. If the participant remains relative to the scale of the whole, within the environment of the magnification, it will result in the discovery of a reality which exists beyond human perception and possibly understanding. It is not suggested that the process be used to create surreal imagery, or to present hyper-real environments for the participant to interact. Rather, it is to be used to gain an understanding of the complexity of the physical world and its relationships. The result of this heightened awareness and understanding of relationships at various levels of detail may allow us to manipulate the physical world through design, on a level that is responsible to all elements of reality existing as context. The value of the abstraction is the concept that allows us through the machine to gain insight beyond our normal frame of perceptual reality.

Conclusion.

Landscape abstraction should transcend traditional human understanding of the physical world, and most importantly extend the limit of our perception of reality. The reality that exists within the mind is a mixture of learned, contextual, and culturally encoded collective memory, as well as the personal interpretation associated with the visual images captured in the present, immediate memory. Realism and literal
spatial representation of reality lack the perceptual stimulation of the participant required to represent place within the physical world. Abstraction, rather than simulation allows the opportunity to explore concepts integral to the physical world through representation that does not pose as reality, but captures the essential qualities of place. The imitation, or capture of essence allows for the representation of place as opposed to simply spatial representation. The concept of place, in the physical world, is important to the representation of reality in landscape. Essential abstraction within the computer environment presents the opportunity for this representation. The conceptual process through image creation within the computer should be based upon abstractions of the integral aspects of the physical world and the corresponding personal perception of it. An image less than this is simply a pretty picture that 'looks like' reality (Figure 1).

References.


Image A. "Poster Eyes", Miller, D. 1999. Although only a small portion of the image is of the Warhol representation of Marilyn Monroe their is enough information in our memory available to "fill in the blanks" and give the image meaning.
Image R. "Imago Mundi", Latourelle, R., 1990, Human interpretations of experienced reality often transcend the purely physical form drawing upon, and combining a collection of experiences that make up ones recollection.
Image C. "Rez", Dixon, J. 1999, The collective memory of place (as a part of the simulated composition, in this case the setting) may invoke responses and conjure new relation to the image.
Image D. Christensen, S., 1991, Can simulation of essence within the machine, result in a depiction of actual reality? The complexity of the environment with seasonal variations such as growth, light, wind may make true simulation impossible.
Image E. "American Pomo", Siemens, J., Abstraction presents the opportunity to construct conceptual models of the representation of place.
Image F. "Memorial", Corna, l., 1991, Abstraction prescribes more to the ideal exist outside of the boundaries of physical possibilities.
Image G. Computer generated landscape abstracted from the ideal.
Image H. Exploration of landscape abstraction through the manipulation of scale.
Image 1. Resolution of landscape exploration based upon manipulations.

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Footnotes.


Ibid.


8Ibid. pg. 33

9Ibid.


18Ibid.


21Ibid.