Mapping A Sensibility: Computer Imaging
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"The work of art," as the surrealist André Breton said, "is valuable only so far as it is
vibrated by the reflexes of the future." These "reflexes of the future" have
introduced, since the early 1990s, increasingly powerful visual technologies. To
rephrase André Breton — in certain critical epochs, art anticipates effects that are only
fully realized by newly emerging technology and new art forms.

It is often stated that our "new information society," or "the electronic age," is now at a
critical time of societal transformation. In this transformation, new visualization tools are
predicted to play an increasing role.

How can we gain an insight into the characteristics of the emerging visual media? According to André Breton's perspective, contemporary art concerns can anticipate those of the new visual technology. Therefore, by mapping one to the other we can locate clues pointing towards a changed visual sensibility.

The following text maps contemporary art concerns to computer imaging in three
major aspects of image making. First, the techniques of forming an image are called, "image forming". "Image forming" is a term used by art critic Max Ernst in 1936 to describe the "interaction" after the "person-machine relationship in computer science." The last aspect, the
interaction with its relational matter, is called "Reality." It is these three sensitive areas that begin to subtly shift as new technology forces adjustment in human perception.

Image Formation

Many computer graphics techniques are modeled from existing techniques in other
visual media. Computer graphics demonstrates starting facility in perspective,
texture, as well as another obsession of the arts in the twentieth century, modeling
with light. Ray tracing algorithms, for example, produce subtle displays in mirrors,
lenses or glass. "Paint systems" model two dimensional painting by hand. Key frame
computer animation is transposed from cel animation in film. Fades, dissolves, zooms
and other grammatical transitions of film and television are also available. This brief
number of examples indicates the ability of computer graphics to easily absorb many
existing techniques proven effective by earlier media. What we can now suggest
are the following unexpected capabilities.

Integration Of Visual Techniques — First there are new combinations of known
imaging techniques. The moving point of view is a simple example. This technique
combines the advantages of three-dimensional drawing with the camera's
freedom of movement. Thus, motion dynamics allow the viewer to "fly" around a
newly created object. One can expect that future developments will combine
visual techniques with other disciplines such as digital sound.

New Description Systems — A second unexpected capability is the arrival of a
new visual description system such as fractals. Fractals are based on a different
geometry than that which underlies most three-dimensional form making. This
geometry offers new ways for artists to think about forms — such as intervals of
call and response. The "three-dimensional" art created can produce infinite detail. Its power
to describe detailed natural forms such as grass, plants or terrain is proving to be an
image breakthrough in computer graphics.

Windows — A third unexpected capability is a change in visual format. Max Ernst
described his collage in 1936 as "a meeting of two distinct realities in a plane
foreign to them both." This statement describes a visual environment very
different from the consistent spatial unity of a perspective image. It also describes the
overlapping windows of progressive activities in the Smalltalk programming
environment or spatial data management systems. Within the history of collage and
collage, art and film, these window frames are unique. They are user directed
viewports into ever-receding depths or around ever-expanding horizons of
information.

Automation And Creativity — One fascinating aspect which can only be
suggested here is contemporary art's exploration of levels of artistic decision-making.
Both art's compositional techniques, as well as chance and random
procedures are now being automated througherez. Perhaps it is for this
reason we see more emphasis on the creative process itself. Ironically, it is possible
that music is a case study in artificial intelligence. Marvin Minsky said in
the New York Times, "You have to make a composer, programmer..." that means your
attention is drawn not so much to the rules of the surface (of the music) but to the
rules of how the composer decides what to do next." Similarly, we will likely see
an increased interest in the mental processes of image-making.

Interaction

Pulling back from the image technique itself, we find a person in relation to that
image - he/she interacts. In the language of film, TV, theater or painting, this
position is occupied by the viewer, the spectator, the audience. It is significant that
in computer graphics, this person is always referred to as "the user." This may be
obvious to the world of computer graphics but a radical change for most visual
production. But again there has been

anticipatory art. The 60s happenings,
theatrical improvisation, the 70s performance
art tried to stretch, dissolve, reform,
destroy the formidable spectator-object
boundary. "Guerrilla" TV encouraged "talk back
to your TV set" through social action video
and community TV. All awkwardly anticipated the powerful and natural
interactive relationship between user and
machinprogram. This work has put such a
strain on art language that the best, but
inadequate, word to describe the new role
of spectator is "participant." In terms of the
historical image-making world, this change
demands a fundamental reorientation of
subject-object relationship.

Mental Shelter — Architectural structure may present a better analogy than film, TV,
painting or photography to re-think the subject-object relationship. A building
creates an environment for movement.
Unless it is a prison, the architecture does not attempt to precisely control persons.
"Tama," a play in Toronto, anticipated this type of application as a means of
creating an environment for movement.
Simultaneously one plays an adventure game, flies a plane through a desert and branches
through an information space. The twist to this situation occurs, for example, in
teaching programs designed to track the
individual weaknesses and strengths of the user
and adapt its response. The mental
shelter has become an adaptive organism.

Reality

At last we arrive in the trickiest terrain —
so apparently innocent. The core of visual
art is the ever-mentioned link between the
image and... something. Since no serious
art can avoid this issue, artists generally
have a healthy and often amusing joke about visual conventions that lay sole claim to "reality." This
had not always been the case.
Photography introduced an indelible
trauma into western art's smug acceptance of
visual conventions they believed truly
depicted "nature.”

In the mid-1800s, for instance, capturing
such things as a horse in gallop was a
perplexing problem. The photographer,
Muybridge, took up the challenge and pro-
duced a series of photos that contradicted
all previous representations made by artists.
The meaning of "true to nature" lost its
force. What was true could not always be
seen and what could be seen was not
always true. No artists would then dare
to paint a horse in the old position without
risking public ridicule. Photography had
won a powerful victory in its correct role
as "evidence" in our culture.

Reality links — Updated computer graphics
make a direct link between changing
measurements and corresponding changes in
visual representation. In the past, complex
charts have attempted to picture large
patterns and abstract relationships.
Animation has attempted to illustrate pro-
cesses. But to directly and dynamically link measurable changes in the world to
changes in visual representation is a dramatic step in the history of images. It appears that since the invention of perspective (and its descendants in the optics of photography and film) or the appearance of movement in film through persistence of vision have we added such a powerful new imaging tool to our culture.

Perspective offered the analysis of space,
film the analysis of motion and updated dynamic images the analysis of abstract
relationships.

We began by looking for signposts to a
changing sensibility in our image environ-
ment. We characterized the common terrain of contemporary art concerns and
computer imaging. What we found was an increasing integration of visual techniques
and conventions, a close embrace of particip-
tion (user) and object (machine environment) and a close-knit bond between
dynamic images and measurements of
abstracted relationships in "reality." These
are generally indicated by three cases.
It is likely they will be furthered by computer
graphics' chameleon-like ability to simulate
both mental and physical processes.