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THE LOCARNO PARADIGM

Foundation and First Steps towards a SOLART Expert System

Maybe the LOCARNO PARADIGM is part of the Monte Verita tradi-
tion. In the best and everlasting sense which binds it to this
geographically small territoire of search for sun, peace,
nature, dance, universe...

The LOCARNO PARADIGM that I'm going to present to you is of
course part of other traditions, too. Especially of the tra-
dition of the future. A phrase which makes sense only if we
agree on finding a way to define, to shape, to create future
in an ecologically reasonable way.

The LOCARNO PARADIGM is in search of a new kind of man-machine-
interaction, based on the rules of nature and - as far as we
know them - on rules of the universe, trying to re-define
machine as a human set of human-made inventions that serve our
human living on earth and in space according to those rules.

More specifically the LOCARNO PARADIGM is in search of a ma-
chine - maybe a hypermachine - that reacts like plant and tree,
i.e., which is a solar power station, using the natural prin-
ciples of conversion of light into energy, acting in accor-
dance with cosmic "rules" (if not laws). And like plants and
trees the SOLAR ART machine - SOLART machine - has blossoms,

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colors, is ever changing, growing and dying, and has fruits, that nourish man and animal. We may call the blossoms the "aesthetic" part of the SOLART system and the fruits the "applied" part. One part leads to what we call art - environmental art, solar art; the other towards energy - solar energy.

paradigm   We know that the use of the word <u>paradigm</u> mainly derives from the book <u>The Structure of Scientific Revolutions</u> by Thomas S. Kuhn. The word is used there in a sense closely related to the term "scientific community."

A <u>paradigm</u> is something that is common to the members of a scientific community - and only to them. On the other hand, the common paradigm of some people - otherwise unrelated - creates a scientific community. Such communities (maybe like our art and technology community) are characterized by a strong "inside" communication and common judgements concerning specific issues.

One paradigm that brings people like us in Locarno close together is the common belief that electronic art created something new, something different from static paintings; that we have developed something different in the time-space-continuum; that energy and light create a new electronic space. But this is becoming less and less a paradigm; it is becoming instead a commonplace.

We search for new and more specific connotations inside the artistic and scientific matrix. For me, such basic connotations

new
paradigm   - indeed a new paradigm - are related to the fact that

(1) "<u>organic</u>" machines made by artists/engineers/scientists

(2) using <u>electronics</u>/technology on its highest, most advanced level including responsive interaction

(3) in an <u>ecologically</u> clean, reasonable way

(4) to serve <u>human</u> and <u>natural</u> survival and/or vital reconstruction - as metaphors and symbols and realities.

Art & Machines

Does art have the impact, the intellectual, emotional power to
contradict the misunderstood, misleading, dangerous use of
machines as we see them in war industry, in our "Modern
Times" kind of gigantic nonsense machine parks, in everyday
polluting and destroying of household and nearby macro/micro-
machines?

We do have indeed a counter-history marked by art-machines.
It is extremely worthwhile to study these machines in the
actual context of so-called "intelligent image-machines,"
"interactive video and video disk," "Artificial Intelligence
machines," artistic "expert systems."

Indeed, nobody had a more severe, adequate insight into the
machine age than the artist. This included the understanding
of new industrial forms and their meaning for the human
society (L'Esprit Moderne); the machine that suggests to us
"various spiritual realities" (Enrico Prampolini); the sym-
bolic, ironic, pure intellectual "use" or better: misuse of
machine-design (Francis Picabia); the technological approach
based on the "principle of utilizing living, organic forms"
(Vladimir Tatlin); the understanding of the complexity and
power of cybernetics (Matta); the auto-destructive and auto-
creative part of machines (Jean Tinguely).

Came the nineteen-fifties and came the advent of a broader
use of electronics in art. Some artists, deeply rooted in
the nineteen-thirties, or -twenties even, foresaw the
transition from the machine to the electronic or even
photonic art devices. Among them Ozenfant, who wrote in the
1952 preface to his book Foundations of Modern Art (1931):
"The material world has become immaterial: spiritual. Yester-
day sun, moon, stars, oceans, and mountains were necessary

for poet's dreams: their Muses needed mass and matter! Today
we think there is in the tiny dot that ends this sentence
more organized worlds than stars that glitter in heaven.
Yesterday our dreams of the universe were one-way dreams,
soaring towards the sky. Today our thoughts oscillate between
two fabulously distant but homologous poles: atoms and
stars." [1]

Ozenfant was right: No more one-way dreams. No more one-way
machines. Instead: information-processing systems which
interconnect man, the environment/universe and the machine.

Hypermachines

Towards the end of the nineteen-sixties, some few books had
been written to prove the feasibility of a new practice and
theory for expanded art. I mention here books like Beyond
Modern Sculpture by Jack Burnham, artist and writer like
myself; Expanded Cinema by Gene Youngblood; my own book
Expansion of Art. Together we had common beliefs, common
points of reference, common parameters. Among them: the use
of computers as environmental tools for artists, not only as
graphic systems; a strong, deep feeling for a cosmic con-
sciousness, expressed in the expanding arts; the emphasis
layed on interactive participatory structures; an under-
standing of art as research, to mention just a few topics.

Indeed we were not talking about hypermachines at that
time but about cybernetic systems, intelligent and res-
ponsive systems, with the hope of developing art works
that do "behave" cyberneticly, intelligently and res-
ponsively. It is in this tradition that I speak when I
talk today about the foundation and first steps of an
artistic expert system.
I do want to point out that, despite all the attention
focused on new and actual inventions, the way was
already prepared in the late nineteen-sixties.

To quote just one witness, Jack Burnham (1970) in a lecture, where he said:

> It would seem that all responsive environments, wheter computerized or natural, have the same prerequisite - that is, some semblance of <u>intelligence</u>. We speak of intelligent organisms, but we must acknowledge that environments possess a level of intelligence too, depending upon the richness of <u>ecological channels of communication</u>. Some ecologists feel that we can rightly speak only of a symbiotic intelligence, that of the organism-environment...
>
> Used with more wisdom than we appear to have now, computer systems can sensitize us to information in the environment that would otherwise be ignored (emphasis added). [2]

This meets well with thoughts and recommendations from a computer scientist like Terry Winograd from Stanford University who, in the 1987 edition of the book <u>Interactive Programming Environments</u>, sees one of the basic changes in the nature of programming as "computers [not being] primarily used for solving well-structured mathematical problems or data processing, but instead [as] components in complex systems." [3]

My thoughts which I'm expressing here do not - as you can hear - follow any sort of well-structured system. They fly and dive back and forth from what I started with to where I am now. I'm not at all trained to speak about expert systems in the narrow sense of a technician of knowledge or, of a computer scientist.

But my own predictions from two decades ago cannot be wrong when I wrote, for instance, in my book <u>Expansion of Art</u> [4], that it is important for the future computer-generated art

(1) to raise the complexity of the program and (2) to create chances for interaction in real-time; and when I read Terry Winograd's "Towards a solution," stating: "The systems we build will carry out real-time interactions with users, other computers, and physical systems... The machine must be thought of as a mechanism with which we interact, not a mathematical abstraction which can be fully characterized in terms of its results." [5]

The SOLART Expert System

Before showing you the first of two digital videos, I do have to say something about why such a system might be integrated into my SOLAR SCULPTURES. They are vertical constructions (with a height of approximately 30 meters in their final stage) with wings furnished with solar cells that follow the position of the sun by means of computer-control.

> The SOLART Expert System is part of the preparatory work for and will later on serve as sort of "brain" for solar sculptures.
> The sculptures are designed to receive natural light and transform it into energy. They are energy banks as well as being part of an energy network. They are based on ecological systems, putting art back into the environment: SOLAR ART.
> As these sculptures are in a true and real sense res-ponsive, environmental, enhanced-dimensional, energy transforming systems, they need to have sort of a sensorium, an environmental programming system which might for the time being be best realized by an expert system.

(In the conventional sense, we understand the expert system as being founded on a basis of knowledge constituted by different facts but also relations, experiences and rules, stored in a data bank, requiring transmission programs to render the basis of knowledge applicable to the individual user case.)

On the one hand the SOLART Expert System works as a graphic interaction system through which images, data, and graphics can be called up in real-time. Here, computer programs based on symbols are employed, which are meanwhile also available for microcomputers. The knowledge base, flexible within itself, contains technical expert and environmental information, for instance about radiation in general, about its distribution in different regions, about the consumption of energy in local and regional areas.

the video

A short summary of what the video will show: The first part involves light; the second part (technique) contains the elements of ecotechnology, photovoltaic, electricity; the third part (environments) mentions metabolism, landscaping, urban settlements among other topics.

The knowledge of such a SOLART Expert System, however, includes numerous additional factors related to, for example, architecture, material science, stability. In addition, it encompasses many fields that contribute to the essential concept of light and of light in art. Light today as we use the word is nothing more than a general metaphor which, it will be revealed, is the basis for a semantic network within the system.

The video is called "A Simulation", is not interactive, is sort of a prelude and I will turn to this after the monitoring/screening of the video, which was made during my work as Research Affiliate at MIT, Cambridge, Massachusett: in March 1988. Basic elements are taken from my visual notebooks.

From Simulation to Interaction

The videotape is still a linear, serial and passive medium

for the one who looks at it. So if you ask me which medium would be best fitted to contain a visual artistic expert

system for the moment, I would say: the <u>video disk</u>, made inter-active by interfacing the player to a computer unit. (The video signal, which has 30 frames per second or 1,800 per minute, brings the storage capacity of a 30-minute video disk up to 54,000 frames, each of which is directly accessible.)

So the communication medium for this very moment is computer-technology, a monitor, the artist-scientist-new synthesis kind of video disk plus player and interface, which integrates these parts with the authoring system. (A genlock system might be of extra value for providing text overlays. By genlock one usually understands a device which synchronizes text and/or graphics made by computer with a video signal containing 625 lines.)

Yes, the video disk is an appropriate medium to overcome the actual simulation. But as a practitioner of environmental and electronic art I - like other colleagues - run into numerous problems, which can be solved only if we in a broader sense

agree on several suppositions:

(1) According to a strong shift of artistic innovation towards electronic art, <u>budgets</u>, <u>funds</u> must be put into the artistic research; outside some few circles of more or less applied media work, it is impossible for an artist to get funds for analysis and production of advanced interactive expert systems (the production of a video disk costs anywhere from $ 20,000 minimum up to $ 50,000).

(2) University and general laboratories should be opened at least during certain times to artists-in-residence to allow <u>dialogue</u> between science and art which, in the process and in the results, would benefit both sides. The foundation of new

centers for interactive environmental strategies and in-
telligent systems should take into account the integration of
an art research department right from the beginning.

(3) As art is part of the search for a new "axiological
informatics" replacing the old model of positivistic infor-
matics (René Berger at the "Synthesis" workshop in Offenbach,
1987), every effort that goes into artistic re-search goes
into a more general "<u>human</u>" definition of our society.

(4) It is solely the artistic phenomenon that provides us
with material which enables us to find <u>metaphors of signifi-
cance</u> within social, cultural, geopolitical and electronic
changes. We cannot forego ascribing these metaphors to the
electronic fin de siècle. They are characterized by the
fact that the artist creates <u>open forms</u> and <u>symbols</u> accessi-
ble to the general public.

Such open forms and metaphors are in the center of my own
artistic research which developed over the years from a more
intuitive but rather existential reference towards natural
light (second part of the nineteen-fifties), to the inclusion
of multimedia channels and spaces (the sixties), to the
fluid spaces of the ocean (end of the sixties into the
seventies) and now again towards light.

> The <u>LOCARNO PARADIGM</u> with which I started my talk is -
> as I said - in search of a new kind of man-machine-
> interaction, based on the rules of nature and of the
> universe. Maybe it is a very old kind of "machine" -
> if it is allowed to take the concept of the machine
> in a very broad sense.

Maybe it is a <u>Mandala</u>-machine if we understand the Mandala
(indeed very closely related to the Ozenfant-statement that
I quoted before) as "earth and man, both the atom that com-
poses the material essence of man, and the galaxy of which

'the earth is but an atom. Through the concept and structure of the Mandala man may be projected into the universe and the universe into man." [6]

The LOCARNO PARADIGM cannot be better expressed than by Peter Russell more than 12 years ago in his thoughts about a new metaparadigm. I want to quote these two sentences by him: "The present technological paradigm is clearly in need of replacement... a new paradigm must be structured, one that is holistic, ecologically sound, non-exploitative and culturally sensitive. But it is unlikely that a truly holistic-ecological ethic can be built into technology if it is not already built into us as well." [7]

As part of my artistic concepts I would like to show you the videotape "Solar Energy Sculptures", 1987, which combines elements of three-dimensional work in the environment with models of my solar sculptures and which is basically an electronic "signature" of the elementary force of light - light understood as wave and object, as implosion and explosion, as metaphor and reality.

Notes

1. Ozenfant, Foundations of Modern Art (New York: Dover Publications, 1952), VII.

2. J.W.Burnham, "The Aesthetics of Intelligent Systems," in Science and Technology, ed. Jonathan Benthall (New York: Praeger, 1972), 108.

3. Terry Winograd, "Beyond Programming Languages," in Interactive Programming Environments, ed. David R. Barstow, Howard E. Shrobe, Erik Sandewall (New York: McGraw-Hill Book Company, 1987), 518.

4. Jürgen Claus, Expansion der Kunst (Reinbek bei Hamburg: rowohlts deutsche enzyklopädie, 1970), 124.

5. Terry Winograd, "Beyond Programming Languages," 521.

6. José and Miriam Argüelles, Mandala (Berkeley and London, 1972), 12.

7. Peter Russell, "Inner Technologies," in Radical Technology, ed. Godfrey Boyle, Peter Harper (London: Wildwood, 1976), 234.