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Into the Hollow of Darkness

A Virtual Environment Project on Interactive Peripheral Perception

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Abstract :

The author considers the meaning of interactivity and the potentials of virtual environments, to explore, in particular, the total visual field and its periphery. She presents her artistic project whose aim is to cause the viewer to become more sensitive to his or her own perception, respecting images and indistinct sensations they may give birth to.

Virtual environments offer new possibilities for exploring perception, by linking — thanks to interactivity — the viewer's behaviour to the totality of his or her visual field. *Into the Hollow of Darkness* (http://www.cicv.fr/creation_artistique/residences/annesarah/), a panoramic project in progress, exploits the peripheral area in an original way, encouraging the viewer to adopt other behaviour towards images and sensations.

I will first present a few interactive installations which changed my point of view on interactivity. Secondly, I will discuss the sources of the current work, both in regard to my previous realisations, in addition to their relation to other art (painting, literature). The third and last part will develop the project itself, its problems and results. Images will illustrate my talks.

1. Some interactive works for a reverse act ?

One can ask how interactivity constructs the meaning of the art work. More value is generally granted to action than to contemplation (negatively connoted because it is considered passive) of the work. There reigns a demagoguery: the viewer would be more present in their relationship to the art work because he or she would “manipulate” or “literally” transform it; he or she would take part in its realisation, and would become its co-author. However, as with a painting which we can look at for a long time and interpret differently according to moments/years/centuries, the artistic relationship between a viewer and an art work exists within, mentally (we began this reflection in an article [1]), and essentially concerns the viewer. The transformation pole must not be confused: It is the transformation of the viewer which matters. Yet, the art work, and so the artist, aims to influence the viewer, by communicating differently ideas, emotions, sensations, etc. Acting on an art work becomes interesting only so far as it allows one to act indirectly on oneself, thanks to an action/reverse, reciprocal

thought, allowing a change in one's way of acting, seeing, one's way of being in the world.

In the context of this duality “centre of action/centre of transformation”, or “movement/interiority”, a few art works that deal with “active contemplation” or “passive action” on the image have inspired me. Each of them happens to offer reciprocity in action. I will present them in the order I discovered them.

These works give sustenance to my thoughts on interactivity, and in particular on the function of gesture, as a vector of power, and on the meaning of the power. Above all they have shown me that it was possible to use interactivity in a different way. However I cannot claim them to have had a direct influence on my project.

The first work that affected me is *Zerseher*, Sauter/Lüsebrink, 1992, Germany (Ars Electronica, 1992, and <http://www.stenslie.net/stahl/txt/transmediale/sld009.htm>).

The direction of the viewer's gaze is picked up (camera + computer) and slowly modifies a woman's portrait (2D simulation of a Renaissance painting ?) until it destroys all figuration, all legibility. The action of the gaze is irreversible: by looking, one destroys.

The interpretation of this work is rich in several possible inversions: if I can destroy by looking, can't I then create by looking as well? If the person in the portrait is watching me, and watching me destroy her, couldn't she destroy me by the same means? And, as in the *Las Meninas* (1656) by Diego Velázquez (1599-1660), the art work gains in richness through the crossed gazes (according to the analysis of Michel Foucault [2]). Or isn't she erasing herself, and taking herself out of my sight, sinking under the simulated pigment, like a creature under the sand? *Zerseher* shows how our gaze is inevitably active, on things, on the world and on ourselves.

In relation to this action of looking, we could mention the video work (non-interactive but visualising a mental interaction) *Der Garten*, from Tamás Waliczky, Germany, 1992, where a child perceives the world in a spherical way, bent depending on his proximity. Moreover, the parent, who is observing the child, is subjected himself to the influence of this gaze, because he sees the world bent according to the child's perception and subjectivity: he takes on the child's point of view. To exchange one's eyes, to see with the eyes of those one loves...

The second interactive work which has retained a hold on me is : S. Biggs, *Shadows*, GB, 1993 (<http://hosted.simonbiggs.easynet.co.uk/installations/shadows/shadows.htm>).

The viewer is in front of the image, in which a group of naked men and women are lined up laterally along the width of the surface. Situated in the video projector field, the viewer projects his or her shadow among them, without wanting to, without even noticing it, (this is picked up by a camera + computing device). The group moves apart, as if to let the viewer pass, but does the viewer want to pass through the wall ? Is it politeness ? fear ? — a feeling which can perhaps be justified by the men and women's nakedness in front of dressed viewers, who are thus in a situation of power.

We find our inversion principle again, the identity between what is seen and what is seeing : those men and women are me and you. We move apart to let someone pass, it is a banal scene, except for the nakedness. The interaction between human beings is constant. *Shadows* makes us feel the space between us, and our own power over one another, whether we want it or not.

This art work thus emphasises an inadvertent action, an aside action. Without wanting to, or knowing it, by our mere presence, by our mere shadow, the double of our body, we modify the space, the world. Our whole outline acts on what is around, nearby — it is not transforming an object, it is moving it a little, but how significant that little is !

The third piece which struck me is *P.M.E. (Père Mère Enfant) Father Mother Child* by Armand Béhard, France, 1998.

The viewer is situated in an open and broken device composed of several screens (areas of, respectively, the father, the mother, the child). A wire-framed cube (the child) circulates rapidly between diverse visualisation zones. The viewer interacts by taking one of the screens. He or she is thus immobilising inside the cube (symbolical isomorphism cube/screen). He or she is also immobilising themselves, being able to watch better.

Apart from the minimal aesthetic choice, and the emphasis on spaces in between, the out-of-field between screens, this art work is at variance with the traditional use of gesture : the interaction here has an immobilising, stabilising action. You stop the cube movement (the child) who was running from his father to his mother without managing to construct himself. The viewer acquires a symbolic place inside the family, his or her contact helps to construct the child, and his or her own vision.

Through these three examples, the meaning of interaction gains its power. Action is open, polysemic, but above all, it becomes a relationship rich in reciprocity. The viewer becomes aware of gesture and of its symbolic value. Transforming the work, and considering its repercussions, the viewer becomes aware of another relation to the world and transforms him- or herself.

On reflection, the interactive device of my own project takes up these ideas of the immobility of the body necessary to the gaze, the inadvertent action, and the possible destruction of what one is watching by dint of wanting to see it.

Yet the objective of my installation remains completely different. *Into the Hollow of Darkness* intends to make the act of perceiving (in its inexpressible dimension) more sensitive. By refusing a clear understanding, it looks for feelings. It is concerned with "bad" vision, with what one cannot see well : not only are the phenomena abstract, constantly animated,

transparent, fleeting, but they are localised in periphery, and low-lighted. It is a matter of feeling the totality of the visual field, and its quality variations.

2. Origins of the project

2.1. Earlier signs in my previous work

The opening of the image has happened step by step from the whole width of its surface to its edges :

In *Aforme, Un peu de peau s'étale encore, Some Skin Is Still Spreading* (animation, 30", 1990), the animated surface, laid out in "all over", obstructs the focal point, and obliges the viewer to look at it directly. The surface is emphasised ; the literal depth, the volume, the perspective disappear in favour of a subjective, unquantifiable depth of textures. The textures do not carry the identification, the explanation of matter (the object which is seen is made of wood or metal) but carry a real ocular pleasure. Moreover, small movements disperse simultaneously throughout the image and engender visual sensations which are not centered (or peripheral). As Klee would say [3] "the eye grazes", circulates, comes and goes, gleans. The light there is often dim, so much so that the cells of the eye (the retinal rods are more sensitive in darkness, the cones in greater light [4]) perceive subtleties better. In a poem I wrote at that time, I talk of vision in the dark ("To rummage in the dark to find them, and not to find them", see my French web site).

In *Horgest, Outgest* (series of fixed images, 1991-1993), the centre of the image has often emptied itself, encircled by small wiry, undulating, textured forms. These structure the surface and lead the viewer's gaze from the centre towards the periphery. Working with fixed images has given me a better understanding of the complexity of the image's surface.

Finally, in my next to last realisation, *Etres-en-tr..., In-Between* (animation, 7'50, 1994) two sequences concerned me. The first, from the start, is a shape present in the lower angle on the left. Though scarcely visible it moves, slips, like a thick, reddish snake, while something lighter moves about on the right. The second, towards the middle of the animation, sees the ends of very restless forms trying to rise to the surface of the image but only managing to remain on the edges, opening a mysterious, wild out-of-field. These two moments provoke feelings – very strong in me – of sudden shock : what is happening ? what am I seeing there ? These feelings are all the stronger as my attention is diverted towards other simultaneous events, apparently of greater importance because they are more visible, but lesser in their evocative power.

These complex spaces made me want to enter the image, to immerse myself in colours and in movements.

To know how to manipulate technology rationally and to keep one's own sensitivity intact, as well as the initial ambition of the project is practically attempting the impossible in image of synthesis. Calculation constrains, with or without real time, because of economic difficulties, force one reduce the display : every calculation costs money, every form needs modelisation, rendering and visualisation work, without speaking of the animation work. 3D computer images thus rarely exploit the image field to its maximum.

I make images of synthesis only through love of art, of the emotions it allows us to grasp, to express as an artist and to feel as a viewer. In this search for feelings, and this panorama project, painting and then literature have played an important role.

2.2 The influences of painting and literature

Painting has played a decisive, initial part in my awareness of the surface of the image and the feelings which colours could engender, in all paintings, abstract or figurative. In front of the panorama *Les Nymphéas* (begun in 1914) by Monet (1840-1926), I remember as an adolescent feeling that my eye was tickled by the colours surfacing on its edges. I nodded my head gently, directed it differently, seeking to vary the feelings I experienced. In the same way, the paintings of Rothko (1903-1970) and the installations of Turrell (b. 1943) have allowed me to feel the quality of matter-light and intense visual sensations.

Yet *Into the Hollow of Darkness* has, above all, structured itself, crystallised around the texts of Samuel Beckett, *Pour en finir encore* [5] and *Compagnie* [6], and of Edgar Poe, *The Pit and the Pendulum* [7]. These texts present situations in which, because of the lack of light, sight is almost non-existent and the sense of touch is heightened. You do not know where you are, nor what is waiting for you. And however the space intensively envelops you. The awareness of the body is invigorated by the uncertainty of the perceptions. Literature, probably because it doesn't give anything to see, stimulates imagination and related sensations.

Can a virtual environment, essentially visual, provoke such a feeling, and how ?

3. The project : *Into the Hollow of Darkness*

I realised a first stage at the CICV, during the summer 2001 : *Where It Wants To Appear/Suffer*, 14', no sound. It is what the viewer could watch during some "immobile interactions". It is to be seen at the "Electronic theater".

It is not yet being decided whether I will add an interactive sound environment to the visual part.

3.1 Artistic aims

My project proposes a new visual experience. Initially based around luminous material, the essential component in the image of synthesis, and of its subtle variations in half-light, the project gradually opened up to all the delicacies of seeing, to inexpressible perceptive uncertainties : to what cannot be named but which we feel inside, almost physically. It looks for sensory complexity and disturbance.

The visual elements are very important. The viewer is put in a situation where nothing is represented, where there is nothing to recognise. The images are abstract, often fleeting. The surfaces are entirely, wholly animated by very sensitive, almost living movements. The totality, made up of fibrous and soft textures, evokes simultaneously various realms (vegetables, animal,

mineral) or environments. The forms are super-imposed and layer the space, breaking the rational order of linear perspective. Finally, perception is stimulated by the edges, in the peripheral field of vision, an area where identification is practically impossible ; only movement can be detected. It is a question of perceiving and feeling as if one had never seen anything, did not know anything.

The interactive device allows the viewer to become aware of the power that the images have over him or her, of his/her own desire to look at them and of the reciprocity in the relationship of power. The rules of interactivity create obstacles to clear and central vision. Having entered the panoramic space of the installation, the viewer progressively notes that the phenomena, perceived in peripheral vision, to the left or right, are difficult to see : they slightly move away, avoid the viewer's gaze, or disappear when the viewer turns towards them. Frustrated, the viewer feels even more strongly their hold over him or her, and his or her own desire to look at them. By slowing down their rotation, the viewer discovers that he or she can hold on to the visible forms, approach them, "tame" them ; the forms correspondingly modify themselves slightly. A choreography takes shape. They start to develop complex relationships, as fragile as human relationships. The installation thus gives the viewer the impression that the forms are alive, he/she can even feel that they are being looked at.

The aim of the work is not to offer the viewer a means of decoding a system of automatic rules, nor to offer a static space in which to stroll, but a dynamic and relation oriented environment, where observer and observed interact. It is thus impossible to see again exactly what has been seen before. Every calculation is different from the preceding one, not only because of the interaction, but because certain parameters vary throughout the time of calculation. Moreover, certain forms are not interactive, but move as they wish, without interaction with the viewer : they make the system more complex, both on the relationship level and on the visual. Even if the viewer believes he or she "understands" some rules, exceptions are noted and the work continues to be appreciated because the space is plastically rich and neither simplistic nor mechanical, and develops an open symbolism, making the viewer see and feel.

The interactivity in *Into the Hollow of Darkness* proves to be almost paradoxical. It is a case of limiting the power given to the viewer so as to frustrate him or her. The viewer will be required to adopt inhabitual behaviour, in the face of these images which he or she does not understand and cannot see properly. Whatever his/her behaviour is, the viewer understands he/she is always responsible for what he/she sees. Having become motionless, inactive, almost passive, in order to perceive the animated forms better, the viewer understands that, in fact, he or she must let them come towards him or her.

In doing so, *Into the Hollow of Darkness* attempts to give value to feeling rather than knowing, to seeing rather than action, to contemplation rather than manipulation, desire/respect/seduction rather than control/power. In our society, where everything is speeding up, where we must be successful, fast, this view becomes political.

3.2 Technical elements

From June 2002, I have enjoyed the help of Grégory Daniel and Gilles Baptest, trainee computer scientists, supervised by Simteam and LRDE/Epita, for the programming in C, C++ on Open GL, and for the control of sensors.

The space is circular, limited by the panoramic screen (360°, 3.5x3.5m, back-projection with 4 video projectors + corresponding computers, sensor to be decided). The panoramic screen can be watched by several viewers, one at least equipped with a sensor. The interactive system (polhemus or camera) relates the display of the forms to the speed and the angle of rotation of the viewer. The viewer moves in physical space, but very little in virtual space (only exceptionally and according to certain limits).

The forms are essentially surfaces (2D grids) animated in 3D (textured meshing), about 9 surfaces set in space. Interactive and non-interactive forms co-exist. The forms can be displayed behind the viewer. They can join and then inter-penetrate. The major element in the plastic work consists in choosing the parameters of rendering and visualisation. A scenario describes the spatio-temporal events for each form and the possibilities of inter-action. Once the form has been activated, certain parameters of the visual scenario can vary according to the viewer's behaviour.

Three types of interaction are defined according to the interpretation of the "sensor's givens", making it possible to codify, classify the viewer's patterns of behaviour which in turn prompt the behaviour of the forms.

- Appearance of the forms which are peripheral to the visual field ($65^\circ < \text{angle} < 85^\circ$? Central vision : $\text{angle} = 0^\circ$);
- Reaction of the forms (flight, disappearance, immobilisation, trembling, etc.) according to the parameters and the scenario;
- Development of other minimal relationships/inter-actions (variation in colour/light/fog, in texture, in surface movements).

Parameters to be considered :

- Calculation time from the start
- Position of the viewer
- The viewer's angle of rotation
- The minimal speed of the viewer (Smin, Smax ?)
- Length of the minimal speed
- Position of the activated form
- Angle of appearance (+ or -, to left or to right)
- Length of appearance
- Delay in reaction in the movement of the activated form (not immediate, for it is non-automatic/living, sensitive)
- Direction of the movement (+ or -, according to the direction of viewer's rotation, variable)
- Length of disappearance

- Added to which are those of the lights, the fog, the materials of the forms, the textures and the movements of each of the points of the forms (which is a lot, but what joy to put them all together!)

All these parameters must be chosen very precisely and matched up in respect of slowness, speed and dynamics, because they are what will give the sensation of life to the viewer.

Some elements are not decided yet. Is it necessary to deal with exceptional cases : if the viewer moves all the time, could we

imagine that the forms come to watch him or her, and stay immobile ? If he or she never moves (but at least enters and leaves from the panorama), the autonomous forms are in any case sometimes visible and encourage him or her to move. Is that sufficient ? The viewer has to make a slight movement in order to come in contact with the environment/world.

One must take into account the possible tiredness of the viewer when choosing the values controlling the display (speed of the viewer, angle and length of appearance). The choice of whether to introduce music also depends on this, for if too many stimuli reach the viewer, without him or her being able to comprehend them, the viewer might not perceive the intention behind the installation.

4. Conclusion

The first stage consists in creating the visual and interactive scenarios (the temptation is big to hide in such a dynamic space a few unexpected events). We will no doubt create a head-mounted display version and a "Cave" one, more portable than the panorama, in order to obtain the final financial backing. But to work so precisely on colours produces technical troubles, and hence financial troubles. I envisage adapting the environment for a dance show too.

If existing PCs are quite adequate to conceive a project in 3D real time, it is not always easy to access the interfaces of virtual reality, especially for an artist like myself who works on her own. The male world is sometimes distrustful. Head-mounted displays are tiring and disappointing because their screens are too small. Distance sensors, which allow the viewer to be unencumbered, are still not sufficiently sensitive, relative to their cost.

But I believe that it is through projects such as this that we can push the boat out together. By relating the totality of the visual field to the behaviour of the viewer, the realm of exploring perception opens up unbelievably.

I imagine a child playing with the device, laughing, turning with arms open wide, looking out of the corner of their eyes to see if the forms are taunting them, and sometimes stopping to watch the forms, and, enchanted themselves, charming them in turn.

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