

Chapter 2

Mapping Practices for Different Geographies

Christina Ljungberg

English Department, University of Zurich, Switzerland
cljung@es.uzh.ch

Abstract

That maps are among our most valuable heuristic instruments has become even more pronounced in our contemporary technosocial environment which demands continuous cognitive activity: the sophisticated new technologies pervading everyday life have not only become an integral part of it but also effectively produce new forms of human positions and positioning involving us in active and continuous interchanges in realtime. This implies that they generate nothing less than new modes of subjectivity. Although maps have to some extent always fulfilled these functions, what is different today are the technologies at our disposal, which not only generate new dynamic spaces but which also enable and challenge us to come up with new strategies of mapping allowing for both improvisational and subjective positioning in constant negotiations for space.

This development has been increasingly interrogated by digital artists. Seeing the need to create new mapping strategies, these artists have their works even go so far as to imply that the subject-object framework be relinquished for that of an implicated agent and an expansive field in which the agency of any presence is intertwined with other agencies. Such an approach would involve mappings of the intermeshing between agents responding to their environment in ceaseless participation. What would these maps look like? Are we, as some suggest, at the point of entering a new shift of mapping paradigm, similar to the one that occurred in early modernity when the ‘scientific’ maps produced by cartographic projection replaced the illustrated and highly narrative medieval maps? Cartographic research and cyberart join here as such an approach would seem to carry the potential not only for theorizing forms of mapping our rapidly changing technosocial space but also for a fruitful dialogue among art, technology and science. This will be discussed by examining the works by digital artists Stelarc, Char Davis, Rejane Cantoni and Daniela Kutschat.

2.1 Introduction

What mapping practices are used to chart the technosocial spaces created by new technologies and how can we orient ourselves in such new expanses? As new technologies generate new technosocial spaces, novel strategies of orientation become necessary. This development has increasingly caught the attention of contemporary artists who have started to interrogate the spaces created by these new and sophisticated technologies – the Internet, GPS, WLAN, international databanks, RFID object space, smart architecture / fluid architecture, etc. These so-called “anthropotechnical” spaces are radically changing not only our relationships with the life-world but also the way we orient ourselves in space. How do we experience these fields that are characterized by an instant and dynamic relationship between humans and technology? And how can we locate ourselves in a world that is increasingly IT-dominated and therefore fluid, instantaneous and consistently interacting? What new systems of orientation are required to explore these spaces which have been scientifically but not yet philosophically investigated, as these mappings do not only concern novel kinds of spatial awareness but also new modes of subjectivity?

These and similar questions have recently been frequently addressed by digital artists who even more specifically attempt to map the new forms of human positions and positioning produced by our active and continuous interchanges in real-time. Although maps have to some extent always fulfilled these functions, what is different today are the technologies at our disposal which not only generate new dynamic spaces but also *demand* the development of new mapping strategies allowing for both improvisational and subjective positioning in constant negotiations for space.

Locating the subject has always been one of the prime functions of maps – in early modern times, the rediscovery of Ptolemy and the growth of the scientific revolution produced new interest in the human body and the geography of the actual world. This triggered new developments in the fine arts and also in literature: not only were travel narratives adorned with carefully crafted maps but a new kind of writing emerged. The development of printing suddenly located discourse between meaning and its spatial form on the printed page, which made the relationship between rhetoric and diagrams visible. It is interesting to follow how, at the time of geographical expansion, cartographic writing developed when writers such as Rabelais, Montaigne and Cervantes sought to “map out” their worlds for their readers by appropriating the worlds they were navigating through discourse and space. As Tom Conley (1997, p. 3) suggest, even Descartes, Modernity’s philosopher *par excellence*, could be seen as a cartographer who “fashions himself as a surveyor, a topographer, in the double guise of an *ingénieur du roi* and an *ingénieur du soi*”. This new subject had to develop new strategies to deal with the Cartesian space that Western maps embody, making him or her an omniscient spectator of the

projected space that maps represented as objects of art, science and technology. As maps were plotted a new self emerged which was partly defined by the relationship of the self to space. This relationship was however very varied: as Svetlana Alpers (1983, p. 136) has shown, Dutch seventeenth-century map makers and painters, in particular Vermeer, skillfully employed a variety of pictorial strategies to “make the world visually immediate”, foregrounding the map as a material representation combining art and science.

What is different today are the technologies at our and therefore also at the disposal of artists, because not only do these technologies generate new dynamic spaces, they even *demand* the development of new mapping strategies. I would go even further and suggest that we relinquish the subject-object framework for that of implicated agent and expansive field. This field could then be called an “agential space”, as suggested by Vincent Colapietro (2007), and which he sees as a space in which agents are at once caught up transcending their immediate control and implicated in the effective exercise of their somatic, social agency. It involves improvisational and variable perspectives and positions of agents involved in incessant interpretation and recontextualisation. From this follows further that the sensorial experience of such a field or space becomes a function of the way the agent relates to the form of mapping employed. This approach would seem to carry the potential not only for theorizing different fields of research but also for a fruitful dialogue among cultural theory, technicity, and digital art, which I will discuss examining the works by digital artists Stelarc, Rejane Cantoni and Daniela Kutschat, and Char Davies.

2.2 New Spaces

“Agential space”, then, designates the field in which the agency of any identifiable presence is intertwined with other agencies. In other words, these agents or presences are such situated and embodied forces that the exercise of agency is best understood in terms of introducing disturbances into this field, or tracing these intersecting force patterns. The notion of agential space seems all the more relevant in view of the extent to which new technologies increasingly influence our lives. As Nigel Thrift puts it,

We have to look at how, as a result of the intervention of software and new forms of address, these background time-spaces are changing their character, producing novel kinds of behaviours that would not have been possible before and new types of objects which presage more active environments. (Thrift 2004, p. 583)

In other words, the instantaneous positioning relationship that these new technologies produce are based on is an *Umwelt* of information, which releases humans into a coordinate system of (re-) active real-time. The new strategies and grammars of

orientation that such coordinate systems demand have already been analyzed from the perspectives of the natural and technological sciences. The Humanities have, however, not yet taken full account of what this development implies, in particular that it has created a need to redefine anthropological conditions and practices. New grammars of orientation demand new forms of mapping. What is characteristic for the ongoing technological revolution, however, are the informatization of space and a direct embedding of the representation in the spatial structure and in the spatializing technologies themselves.

Of prime interest here are therefore the medial spaces and complex practices of orientation developing against the background of this IT-based folding together of space – map – human. But how can such fluid spaces be mapped? And what would the maps and the mapping of this new space look like, since they would have to involve the description of the relationship between agent and map? Following Ingold (2004) and others, I will argue that, rather than the often-used metaphor of the map as network, these new maps would have to be meshworks. In the sense intended here, meshes are formed by interwoven lines articulating heterogeneous components, producing dynamic diagrams interacting so as to avoid collisions but yet affording growth and movement (cf. Certeau's "wandering lines"). In other words, they are processes involving diagrammatic thought of illimitable scope rather than closed systems of finite objects. Such a pragmatic approach implicates a dialogic and communicative self immersed in incessant recontextualization and, therefore, involves mappings of the intermeshing between agents ceaselessly participating in and responding to their environments.

2.3 What Kind of Maps?

Let me therefore start by defining a map from a semiotic perspective. A map is a diagram, the graphic register of correspondence between two spaces that relationally represents its object. It is this relational quality that provides diagrams with the claim to more or less objectively represent 'reality' that has become discounted in other forms of representation today. I would argue that what makes the diagram such a useful figuration is that

- diagrams are relatively independent to their objects: the relationship between the objects exists independent of the map, and can be independently located and calculated.
- diagrams are abstracted to a certain criteria of relevance that can be generalized.
- diagrams represent both intelligible and sensible relations: they do not need to represent something that exists but can also be a model for the production of something new, e.g. a blue-print of an architect's drawing for the construction of a house.

This is what accounts for the creative potential of diagrams: since they allow experimenting on, both on paper, on screen or in our minds, this very feature makes them excellent tools for outlining both thought and action. It makes them indispensable for formal reasoning: according to Charles Sanders Peirce, diagrammatic reasoning is fundamental to our thought processes. The diagram is a complex iconic sign affording – indeed, inviting – such possibilities of manipulation and transformation as it “suppresses a quantity of details, and so allows the mind more easily to think of its important features” (CP. 2.282).

But what is particular with diagrams such as maps is that they have strong indexical properties, which is what I would argue accounts for their dynamism: diagrams presuppose, even demand interaction. This lies in the indexicality of the diagram/map as a visual sign. Even though the diagram is iconic, it is, as a visual sign, always “embodied in some particular materiality or particular form, or as instance of an iconic representation” (cf. Santaella 2001). A diagram always refers to something – even more so, it calls our attention to the object it refers to and to the formal similarity between these relations.

This becomes vital in map reading. Since the most important function of maps is their interaction with their users, these therefore become part and parcel of the map action – because users must locate themselves within the map to engage with it in order to orientate themselves not only within the map but in the ‘real’ or imaginary space it represents. With map reading, ‘I am here’ becomes ‘I am there’ – a strange fusion of a deictic gesture that points *from* the body to the map (cf. Sibylle Krämer) and at the same time to itself: the diagram or map user, as a body positioned in space, is therefore an essential part of it. Indexicality becomes the condition for the possibility of operating a map. Because maps demand an active user to function, their bird’s-eye or vertical orthogonal view was once made for those who needed an overview to survey their commercial enterprises or lands. That is what makes modern maps off-springs of modernity and embodying the idea of the sovereign subject – not only is the map made from the viewpoint of a “celestial eye” (Certeau 1964, p. 92), but in order to use the map, the user *must* depart from an “all-seeing” perspective or position, mentally taking in – seizing – the environment from his or her point of view. This development focused on maps as objects and products instead of processes of mapping: the convention of perspective made the late Medieval and Renaissance spectator and mapmaker into “a totalizing eye” (Certeau 1984, p. 92), seeing the world as a *tableau* and plan.

The modern map can thus be seen as the epitome of Cartesian subjectivity. Maps were once instrumental for the development of the Cartesian concepts of time and space (cf. Black 1997, p. 7) and it might well be that they will be essential for developing the new sense of space and time instigated by our new technologies. This space is, in Nigel Thrift’s words, “based on continuous calculation at each and every point along each and every line of movement” (2004, p. 583). But, as he points out,

at the same time these new understandings of space and time are characterized by a sense as being “more plastic, constantly mobile and dynamic”.

2.4 New Maps for New Spaces

How can this space be mapped? What features of our present mapping practices can be applied to this new evolving “qualculative” space which would give rise to a “qualculative sense” (Thrift 2004, p. 583)? In his view, this new sense would rely on 1) a series of prostheses for cognitive assistance and which automatically takes care of the navigation (2) a provisional sense of spatial co-ordination consistently revising and repositioning itself (3) continuous access to information (4) a more elastic sense of metric and (5) a more ‘nomadologic’ sense of permanence and domesticity than has been characteristic of Western societies since the fourteenth century (Thrift 2004, p. 593).

However, this sense of space as relative, as ‘becoming’, still relies on ‘absolute’ space. It is still based on the mathematical calculations without which our virtual worlds would be unthinkable. It depends on a “fine grid of calculation”, which is what makes these new capacities at all possible. Such a grid must necessarily be some kind of diagram, which not only embodies the multiple calculations which produced it but which indeed has the possibility to produce new senses of spatial – and temporal – knowledge. It must necessarily also be performative, since it generates new space relative to it, which would mean that, far from being a static and finite object, it should open up new spatial possibilities and potential. Mapping becomes much more a question of perspectives and positions of agents who are implicated in these spaces, allowing for both improvisational and subjective positioning in continuous negotiations for space. Therefore, it also involves the body of agents and the new body schema acquired through the development of sensory (visual and auditory) and intelligent machines to extend apparent body limits (cf. Ljungberg 2006).

Such processes could be seen as a modern anthropotechnical version of the archaic practice of “wayfaring”, which produced sketch maps of travels and voyages. Comparing the function and form of the lines on a sketch maps with those of cartographic maps, the anthropologist Tim Ingold (2000, p. 56, 230) argues that, whereas the sketch map consists of lines drawn *along* a surface, ‘scientific’ or modern cartographic maps go *across*, cutting through the ocean following the course plotted by the navigator. Once arrived (although preserved in a logbook), the ‘ruled’ line can be rubbed out. The ‘sketched’ line, however, is narrative: it is a gesture drawn in a close context to its referent and thus highly indexical as it is made up of stories of comings and goings.

These highly indexicalized maps disappeared with the development of modern cartography, which relied on the subject-object relation to the environment. That relationship was presupposed by Cartesian subjectivity, which made the user of the map an omniscient spectator. Such a dualist approach to the world is precisely what these new technologies now seem to challenge by evoking new modes of agency as involvement in social sets of practices. Moreover, these new modes replace the subject-object relation with that of map users as socially situated and implicated agents in an expansive field, orienting themselves along the lines of the meshwork formed by the interaction between them and the environment. These agents are therefore participants, responding, reacting and interacting to and with other agents as well as to the environment, creatively transforming and transfiguring it. Moreover, the agents –our – relationship to themselves or to ourselves is always made more complex by our relationship to others. That is why we are always situated and embodied forces whose exercise of agency is best understood in terms of introducing disturbances into a particular space or of tracing the complex, consistently emerging patterns of intertwining forces as an ongoing dialogue between us and our *Umwelt*.

2.5 Mapping Fluid Spaces

This development has caught the attention of artists who have always been at the forefront of technosocial developments. Those working in digital media in particular have been insistently interrogating the consequences and the potential of such intermeshing processes. Seizing the opportunity to both thematize and explore what these new technosocial environments *mean* and what positions and perspectives they create, artists have consistently been blurring and eroding the boundaries between subject and object by mapping their bodies into cyberspace, positioning themselves and others as responsive agents. Such transmediality shifts the attention from the individual body to complex human – technology interfaces within collective infrastructures. As Johannes Birringer points out, the resulting interactivity indicates “a new understanding of environments of relations / responsibility and a relational aesthetics based on interhuman exchange or physical interaction as well as a new technological kinesthetics” (Birringer 2006, p. 300).

One of the first to engage with this kind of feedback systems and cybernetic loops was the Australian performance artist Stelarc. Stelarc’s project for the past twenty years has been to try to redesign the body by the means of various prostheses in order to overcome the body’s shortcomings in an increasingly technosocial environment. As he argues (1998, p. 7), the body’s metabolism can no longer “cope with the speed and power, and precision of technology”, but, instead, finds itself in alien

environments “unplugged from its biosphere” and lost in technosocial space. That is why Stelarc finds the body “obsolete” – not that we could do away with it but in the sense that the notion of an ego-driven body like a “simplistic, zombie-like body being driven by a psyche, mind or self” is invalid, if it is not what Birringer (2006, p. 304) calls an “expressive body” that performs and responds with the sensorial environment it is in.

So viewed, the body is not a site of inscription but a physiological structure; it is no longer an “object of desire”, but, instead, an “object for redesign”. Stelarc is not interested in the notion of cyborg as a body that has undergone a traumatic loss of organs and, therefore, receives implanted metallic parts, a “sci-fi, macho, military, metallic-phallic construct” (1998, p. 8). This notion projects a medical body on life-support systems. Instead, he sees this redesigned body as the opportunity for a multiplicity of bodies that can be separated spatially but joined electronically to become connected and thus, evolve into a greater operational entity. The Internet, in Stelarc’s view, is not a strategy ideal for disembodiment, since you need a physical body to be plugged into the system. What it offers is a potential for both intimate and involuntary experiences, such as in Stelarc’s use of his “Third Hand” and by his electronically wiring his own body into the Internet.

By using collective infrastructures such as the Internet, Stelarc achieved to be telematically – and simultaneously – present at the Pompidou Centre in Paris, the Media Lab in Helsinki and The Doors of Perception conference in Amsterdam.

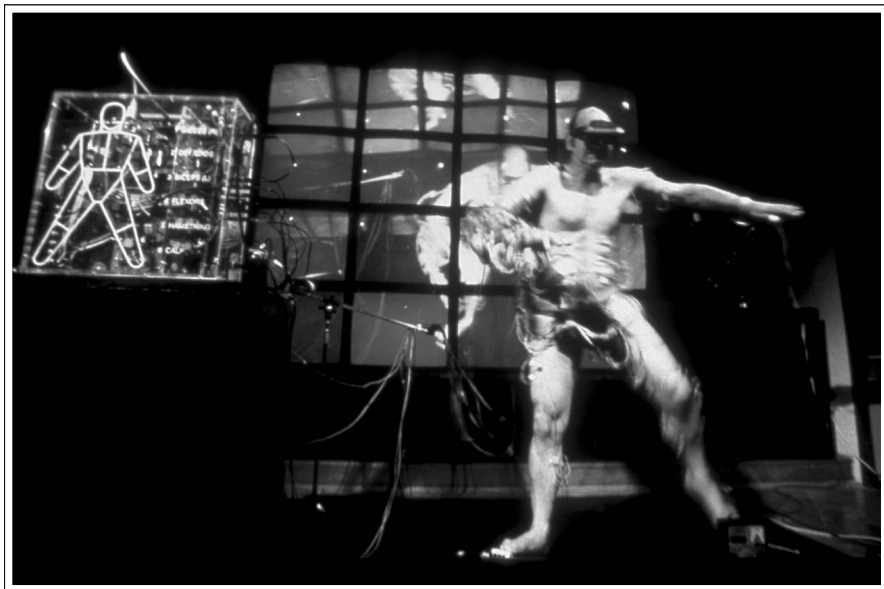


Fig. 2.1. Stelarc’s “Split Body” Performance. (1995) Galerie Kapelica, Ljubljana. Photo: Igor Andjelic.

During his performance, people in these three cities could access Stelarc's body to remotely choreograph its movements via a touch-screen interface. This enabled them to enter another body, namely Stelarc's, in another place, at the same time as Stelarc's body became a "host for the behavior of remote agents" (Stelarc 2002).

Stelarc's performances could therefore be viewed as

- an early and very schematic prototype of the digital meshwork mapping anthropotechnical space as its interwoven cables – i.e. its "lines" articulating heterogeneous components – produce new technosocial space in constant interaction with the map 'users', the audience inducing his movements at the various touch-screen interfaces
- demonstrating how agency might be practiced by bringing in disturbances into a field or by generating complex emerging patterns of intertwining forces
- strongly suggesting the necessity of theorizing a new kind of spatial distribution, in which the categories 'nearness' and 'distance' are made "obsolete" – a word Stelarc himself likes to use when it comes to the body and bodily functions
- an example of the interplay of socially and somatically implicated agents in an expansive and expanding field and in which agents as such are inescapably involved in the lives and activities of other agents. This not only brings to the fore the interhuman exchange and new technological aesthetics that Birringer (2006: 300) observes but also contributes to a new understanding of responsive environments

Moreover, Stelarc's performance enhances the dialogic nature of agential space as the interplay between the users and the various avatars, the "outgrowths" of mathematically calculated grids of time and space, functions on the premise of socially positioned and responsive participation, namely that all parts follow certain prescribed rules and codes.

In his "Ping Body" performance in 1996 (*Figure 2.2*), Stelarc took this even further by considering an agent's physical action not prompted by another agent in a different place but by the activity in the agential field produced by the Internet. During this performance, the ping protocol (the onomatopoeic word for the sound generated by sonar equipment in submarines) in Unix was used to transmit reverberating signals to global locations – live during the performance – that 'pinged' back to the host computer in Luxembourg. The time it took was measured in milliseconds, and these durations were mapped onto the body's muscles through the simulation system. Thus, this time, the body was moving to the ebb and flow of Internet activity, as an agent continuously interacting in a space crisscrossed with patterns of other agencies.

The mapping this performance makes possible is the spatial distance and transmission time to body motion. The ping values from 0–2000 milliseconds indicating levels of Internet distance and density activate multiple muscle stimulation in order

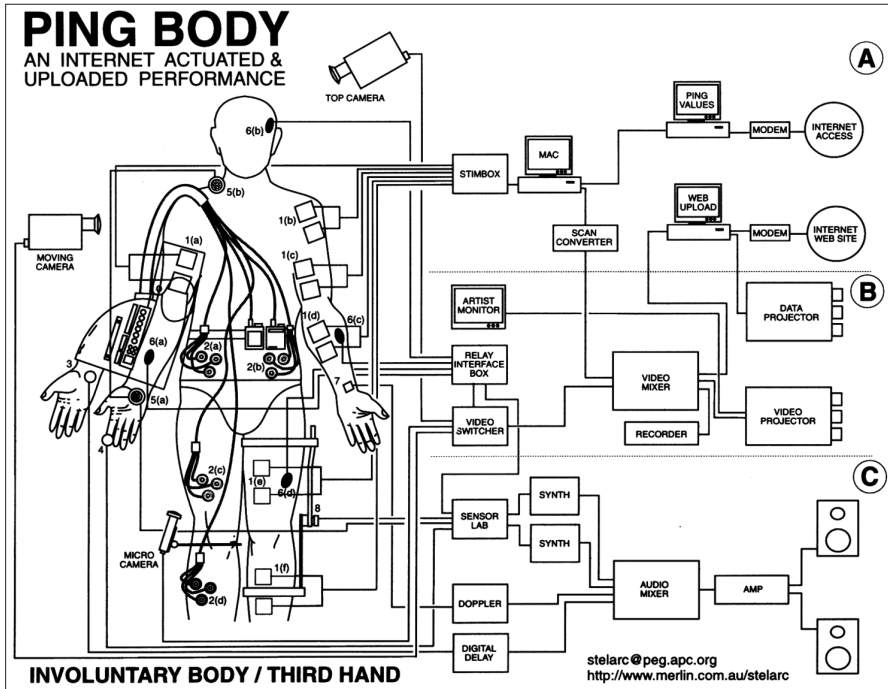


Fig. 2.2. “Ping Body” diagram (1996).

to choreograph and compose the agent body’s (in this case Stelarc’s) performances. The sense of the space produced is clearly “qualculative”, not only because of its use of various prostheses offering more or less automatic cognitive assistance for much of the navigation, but also because its consistently revised spatial coordination is based on incessant calculation, continual access to information and ‘nomadologic’ sense of location. The result, that the agential space, i.e., collective Internet activity, moves a particular agent body and produces physical action, is a compelling inversion of the usual interface agent / Internet, the operation of which is usually determined by collective bodies. In this instance, it is the agential space which not only transmits information but also induces physical action. Space itself performs – and acquires a performative function.

My next example is a mapping of an immersive interactive environment called *op_era* (2001 and 2003), developed by Rejane Cantoni and Daniela Kutschat. Addressing the problem of human / technical involvement, *op_era* explores how and through what kind of interfaces one system may best interact with another and how we can enter and interact with a data world from perspectives we are familiar with, without being disturbed by incalculable devices beyond our control.

op_era is a world shaped as a set of interconnected logical dimensions, conceived to generate spatial cognition through multisensorial experimentation of space

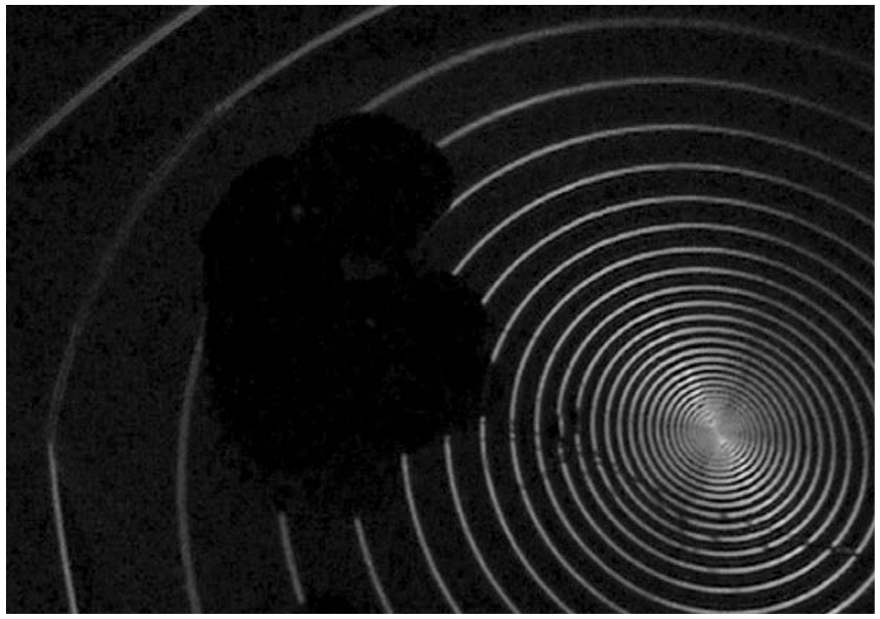


Fig. 2.3. Cantoni and Kutschat, *op_era*: sonar dimension (screen shot)



Fig. 2.4. Cantoni and Kutschat, *op_era*: first dimension (screen shot)

models evolving in relation to the human body. Its logical architecture consists of interacting dimensions structured by logical linkages. Each dimension leads to the next and simultaneously to all previous ones. In some sense, *op_era* has a beginning, a kind of narrative hierarchy from the first dimension to the fourth, but it has no end, nor any kind of narrative path leading from a higher dimension to a lower one. Such a structure is created with the intention to generate feedback loops, which allow events occurring in lower dimensions to affect the outcome of events in higher ones. The technological device the artists are using is the “Haptic Wall” – a SMART wall interface designed to produce tactile stimuli originating from sonic data collected by a set of microphones placed in and around the exhibit area. As soon as a microphone picks up a sound, the software samples and converts it into outputs controlling sensors built into the wall. The four dimensions in *op_era*, namely X, XY, XYZ and XYZT relate to the history of spatial concepts. The first dimension, X, is a finite segment composed by a multitude of points that are sound-based elements representing pre-programmed computational objects that make up the world as sounds. Their nature is to transmit – attack, sustain or release from reverberation to echo – sonorous information. In this dimension, the user distinguishes the shape of space and his or her relative position in it by emitting and receiving sound information. Interaction or space cognition are limited to ear perception; in other words, the overall spatial concept is placed in reverberation.



Fig. 2.5. Cantoni and Kutschat, *op_era*: second dimension (screen shot)

The realm of the second dimension, XY, is flat. Interacting by drawing the shape of space, the artists have it extend into two dimensions: the ‘imported’ one, X, or length, plus width. It contains all the objects of the world, which ‘exist’ only within the limits of length and width, like a huge flat screen. There are four cardinal orientation points – N, S, E, W – within this dimension. Therefore, objects and the human agent / interactor are free to move in four directions – up and down, right or left. All objects are *rendered* as light waves independently of their nature, i.e. whether they are sounds, shapes, or avatars, but *perceived* as vibrating lines, with all occupants of this dimension, including the user, having a common boundary: a space confined to a finite and limited plane. Only by touching will the human agent / interactor know the actual nature of an object, whether it is a shape or a sound element. Since space in XY is confined to a finite and limited plane, the logic follows that if we try to exceed its limitations we will step out of it.

The third dimension, XYZ, is a cubic realm, which turns space into an essentially empty box – a limitless void in which all things are contained and through which they move. Within this imaginary box three forms – a green triangle, a red square and a blue circle – perform a kind of Oskar Schlemmer’s mathematical ballet, as the artists have suggested. All forms have various form “behaviors” attributed to them, translated randomly according to the intrinsic qualities of their shapes. The triangle moves through the diagonals, the square through the orthogonal axes and the circle by rotating like a satellite. This ballet would go on forever were it not for the users’ interaction but, as the human body is incorporated into the spatial scheme, the choreographic algorithm tracks its presence, generating responsive events by changing and flipping the plane and direction.

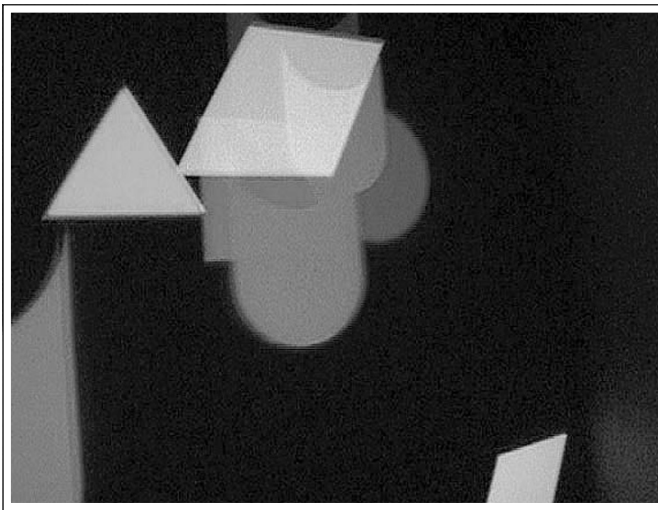


Fig. 2.6. Cantoni and Kutschat, *op_era*: third (cubic) dimension (screen shot)

In the fourth dimension, XYZ and T form a landscape evolving in time. Space is projected as a condensation of all three realms – X, XY, XYZ – composed by a multitude of emerging Lorentz attractors (three-dimensional structures corresponding to the long-term behavior of a chaotic flow) evolving in time according to the interactor's position in a complex, non-repeating pattern. In this dimension, space visualization and cognition is only possible through simulation.

As you can see from Rejane's and Daniela's "short history of space", in this space

- the interaction human / technology is tied to the development of spatial dimensions, even limiting the potential experience of space
- everything is spatially distributed in this responsive field, with several possible points of departure
- the successively 'folding' boundaries, though at first clearly distinguishable, suddenly either dissolve or fold into something else, interacting with the agents' positioning and perspective
- space is 'relative' as it is set in motion by the agent's touch, which foregrounds the importance of the agent's body
- agency is understood in terms of introducing disturbances or tracing complex patterns, with the consequence that, in such interactive motion, space in all its various forms is in – and set in – constant motion – movement-space abstracted

Interactivity in these art works involves an entire environment that can only be mapped through the continuous biofeedback from the artists' sensory stimuli, which is also the case in my last example, Char Davies' immersive environment *Osmose*. The 'wayfaring' along the spaces is digitally created by close interaction with the environment. This is vital – in the word's true sense – since the navigating through it depends on the voyager's breathing in and breathing out. Using semi-transparent visuals and luminous particles for the participants to voyage through her twelve virtual "worlds", Davies bases the interface on breath and balance to allow participants to simply "float" by breathing-in to rise, to fall and to lean to change direction. In addition, the hands-off interface frees participants from the urge to "handle" things and from habitual gravity-bound modes of interaction and navigation. Entering *Osmose* through a 'forest grid', they can then voyage between the twelve various worlds, ranging from seemingly 'natural' ones such as e.g. 'pond', 'earth', 'leaf', 'forest', and cloud to that of 'code' and 'text', all centered around a 'clearing', and ending at the 'life-world'.

Davies is here demonstrating a kind of wayfaring along lines manifesting themselves in the flow of the images as an implicated agent who only partly undertakes this voyage by his or her own will. This is not only because the voyager's lungs, a major life supportive organ, are part of the navigation and force her or him into constant motion – if you stop breathing, you don't move / you die – but also because



Fig. 2.7. Cantoni and Kutschat, *op_era*: fourth dimension (Lorentz attractors, screen shot)

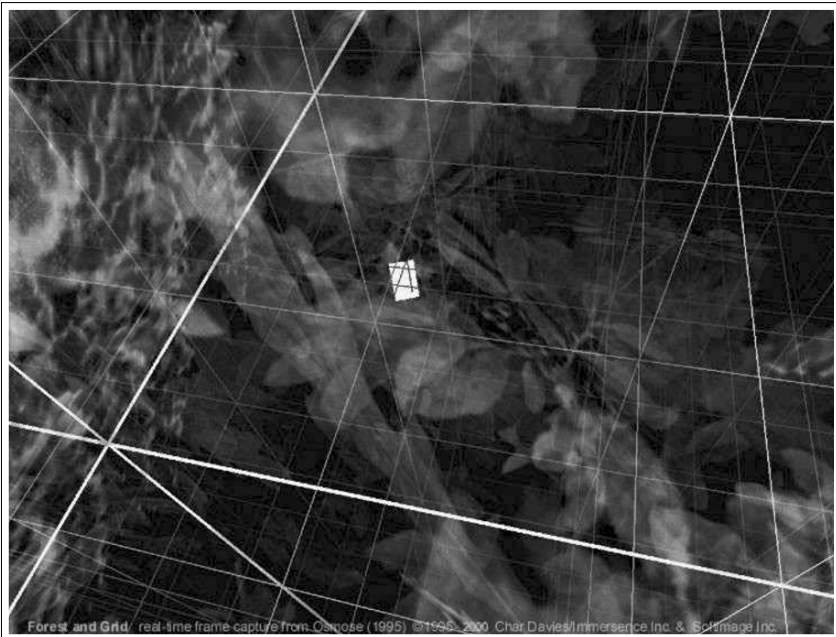


Fig. 2.8. Char Davies. *Forest Grid*. Still image captured during immersive performance of the virtual environment, *Osmose* (1995).

it makes you aware of air itself, as a communal element that we all share and are all dependant on. Moreover, although these VR images look like romantic nature photography, reminiscent of Thoreauan descriptions of pensive ponds and luminous clearings, they are infographic images, creating a numerically based reality. Davies' aim in creating synthetic images is not to project artificial worlds but to "remind people of their connection to the natural (rather than man-made) environment not only biologically but spiritually and psychologically, as regenerative source and mythological ground" (Davies 2004:, p. 75). As she points out, her method "involves circumventing the conventions of linear perspective, Cartesian space and objective realism... in order to collapse a culturally-created distance between subject-viewer and the world" (2004, p. 75).

Davies' immersive space therefore challenges VR's general tendency towards disembodiment. As she points out,

As a realm ruled by mind, virtual reality—as conventionally constructed—is the epitome of Cartesian desire, in that it enables the construction of artificial worlds where there is the illusion of total control, where aging mortal flesh is absent, and where, to paraphrase Laurie Anderson, there is no "dirt"...

(Davies 2004, p. 73)

Refusing to accept such cultural paradigms, she suggests an alternative approach to virtual space based on her "own particular experience of being in the world". That is her reason for grounding the immersive experience on the voyager's own breathing and balance via a user-interface and for using semi-transparent visuals to generate a magic, dream-like world. At the same time, her installations expose the contradiction inherent in virtual spaces. As Ron Burnett (2004, p. 104) argues, it is hard to differentiate between artifice, experience and conscious participation because the immersive power of her installations is such that the experiences are more "visceral" than intellectual. Nevertheless, mapping this floating, ambiguous world requires both questioning our habitual and conventional ways of seeing and developing an entirely new sense of orientation.

So viewed, Davies' endeavor ties in both with Certeau's concept of "wandering lines" and Ingold's wayfaring mapped as meshwork, as interwoven lines of heterogeneous components. Therefore, the space she creates can be said

- to be relative to the Cartesian grid the voyager must transcend
- to force voyagers to be perpetually mobile, breathing and moving through space while
- to produce space-time out of multiple encounters

It could therefore be designated as an example of 'nomadologic' space – suggesting a new sense of space as folded and animate, one that assumes a moving point of view. Thrift's (2004) description of movement-space discussed above throws additional insight into Davies' immersive environment, since he describes this kind of

interactive qualculative time-space as one in which “[i]ncreasingly agents do not encounter finished, pre-existing objects but rather ‘clearings’ that disclose opportunities to intervene in the flow” (Thrift 2004, p. 593). Thrift’s reference to Knorr-Cetina’s (2003) ‘clearings’ seems particularly apt to describe Davis’ cybernetic voyaging. By letting the entire enterprise depend on the voyager’s breathing, Davis has chosen an extreme variety to display the characteristically interactive, dialogical and responsive nature of agential space. Space here is indeed folded and animate, in the sense of not being relative but much more suggesting a new and more plastic sense of space and time making everything “framed as in perpetual movement” (Thrift 2004, p. 592). I would argue that this is precisely what Davis addresses in her immersive art works.

2.6 Conclusion

What new perspectives do these new agential spaces suggest? What new positions and positionings come forth in such artist mappings? I would argue that these interactions humans / technology, the generation of what Nigel Thrift calls “qualculation” (2004, p. 293) and the new apprehensions of the altered time and space they generate demonstrate the extent to which agents, though inherently implicated in social, somatic practices, are yet able to transfigure and transgress these by their creative imagination. We cannot get away from Cartesian space, since the mathematical calculations underlying it also provide the perspectives and projections for the responsive fields in which participating agents are at once caught up in fields transcending their immediate control and implicated in the effective exercise of their somatic, social agency. However, Cartesian space emerges *out of* these formalizations and symbolization, rather than the other way round, that agential placements and positions emerging out of abstract Cartesian space. But what these novel technologies offer are new possibilities of mapping and projecting of and by these bounded, situated agents who are not so bounded and circumscribed that they are not able to transfigure this space by their creative imagination.

As we mentioned earlier, all map reading is indexical from the aspect that it refers a) to the relationship between user and map and b) to the relationship between the map and its referents. In cyberspace, there is yet another indexical aspect. Because, although these various attempts to map technosocial space in digital art involve highly sophisticated technologies, the participants nevertheless need a physical body for the interactive experience, which means that they need to be indexically, i.e. referentially anchored. Interacting in virtual space, the participant becomes a biocybernetic body, divided into two complementary media: one body which remains carnal and “real” in the environment it exists, and its avatar, which is the virtual, disembodied projection of the “real” body (cf. Santaella 2003). Although we

might seem to momentarily lose ourselves in cyberspace, our physical body remains carnal and “real”. That is what makes it possible for us to maintain proprioception, the sensation of self from within the body.

Although the medium of digital art is fundamentally self-referential, as are our digital maps, and may seem virtually non-indexical, there must still be reference in order for us not to lose ourselves in these cyber- and antropotechnical fields. However, in this agential space with its ceaseless intermeshing of various agents, life becomes a meshwork of successive foldings. It is not a network of connectors, since this environment cannot be bounded; it is a constantly expanding space along which we live our lives as a transformative process. That is why mapping this new space requires different strategies because what we are mapping is a world of processes, of continuous numerical calculations and of nomadologic movement of transformation and change.

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Figures

2.1. Stelarc, 1995, "Split Performance". Photo by kind permission of the artist.

2.2. Stelarc, 1996, "Ping Body" diagram. Image by kind permission of the artist.

2.3–2.7. Kutschat, D., and Cantoni, R., 2003, *op_era*. DVD recording of installation, gift from the artists.

2.8. Davies, Ch., 1995, *Osmose*. Image by kind permission of the artist.



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