Actual-fictive-virtual space: theatre interactivity within a "liquid architecture"

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Abstract

The relationship between theater and the world of digital visualization is marked by mutual inspiration. The defined field of meaning of cyberspace has appropriated, explicitly or implicitly, theatrical principles, while contemporary theater and the meaning of such concepts as interactive and copresence are informed by the meanings of computerized virtual worlds.

The architectonic nature of cyberspace, with its main principle of "being there," places the various participants in a single fluid space. Throughout the entire history of theater, the nature of the communication between spectator and actor-character is the product of, among others, space convention. A traditional theatrical situation occurs in a divided actual-fictive space of action -- Bspace. In this space of action, communication takes place within a fixed hierarchy. Where there is active interaction the actual-fictive space of action becomes dynamic. This dynamic feature does not affect the hierarchy between participants, which remains fixed.

The paper seeks to locate and decipher possibilities of dynamic interactive communication in a theatrical situation. This interaction will be examined as a product of the perception of space composition -- actual, fictive and virtual. That is, an interactive theatrical situation will be presented as it occurs in an integrated, fluid space of action, in a space of 'liquid architecture' whose form is contingent on the interests of the beholder.

The interactive communication channel between the world of digital visualization and theater will be examined not only within a theoretical discussion based on comparative study, but also as conclusions drawn from the study of a project to be presented during "The Festival of Fringe Theater" held in Israel (Oct. 2002).

Many interesting attempts have been made to use new technology in theater productions, or to place a dramatic situation inside a virtual world. Few of them have earned the title of "virtual theater". Such an epithet would require the co-existence of theatrical aesthetics and virtual aesthetics.

This essay deals with the reciprocal feeding between the medium of theater and the world of computerized simulation. We shall try to investigate how virtual thinking can be applied within the theatrical domain of meaning, in an attempt to shape what may be defined as "virtual theater". Our claim is that to achieve this, the concept of theatrical space must be changed so that it can assimilate the concept of "liquid architecture", characteristic of a virtual space. A different concept of space will allow for a substantial change in the relationships found in the theatrical situation. This new concept of space will have to address the difference between the virtual and the theatrical worlds, which differ vis-à-vis reality. This is the point of departure for the absorption by the theatre of virtual thinking, for the existence, side by side, of the virtual and the theatrical.

"Give and Take" – The Theater and the World of Computerized Simulation Feed Each Other.

The defined domain of meaning of cyberspace has borrowed principles from the theater – openly or otherwise.[1] We can state the identical ontological nature of the virtual-digital world and the fictional world of theater. The theatrical fictional world contains phenomena that feel and look like reality. One can respond to them as if they were actual, draw conclusions about our reality – even when they do not necessarily possess a traditional, physical basis. In fact, this is also the true definition of the term "virtual" [5] (p.8). The theatrical experience rests on the first, widely accepted aesthetic assumption, postulated by S. T. Coleridge: "The willing suspension of disbelief". The spectator's "disbelief" stems from the ontological status of the world of fiction, knowing that such a world has no actual physical existence. This disbelief is based on the illogical (according to the criteria of deciphering phenomena in real life) connection between a fictional world and the real one.

The primary condition for a virtual-digital world is synchronization of action. In the theater the viewer acts in coordination with the world on stage, and the type of relationship with the audience this world dictates (he sits, watches, strengthens 'role behavior' by applauding, etc., or else he becomes involved in the action to an extent dictated by the creators of the show). Failing such coordination between stage and viewer, a theatrical situation cannot exist [2]. The agent in the digital-virtual situation is defined by the actions it performs. In a theatrical situation the actor is defined by his role – the character he plays. In the same way, the term "audience" is a functional category of the theater: it is a concept produced by virtue of the role played by a group of individuals in the situation. We may say that all the participants in a virtual-digital situation use objects taken from the realism of simulation, and by relating to them, they study the objects and, in fact, define them. The same is true for the dramatic world of fiction. Depending on how the characters on stage relate to it, a roll of blue fabric undulating on the stage can became 'the sea'. The choices of representation are made possible thanks to the theatrical domain of meaning, based as it is on media convention, which is different from natural logic. The representation is validated by the way in which the characters on stage relate to the object.

Thus, the world of virtual simulation comprises numerous elements from the theatrical mode of thinking. On the other hand, it also contains various operational components. The experience of a subject entering this virtual digital world is unmediated. Nor is the virtual world founded on a preliminary design of action, but on the potential of a set of actions fed into it as part of the representative world itself. The fictional world of theater reposes on a built-in process of pre-designed actions. These differences between the operational process of the virtual world of simulation, and the theatrical fictional world, are the immediate outcome of the divergent relationships involved in these two worlds.

The virtual, simulated world sustains an interactive relationship, while the fictional world of theater relies on interaction-reaction. The elements most conspicuous for their inequality in the theatrical interaction are: initiative and control. The theatrical spectator, while participating in the defining of the theatrical situation, remains totally dependent on the group of creators. Even in the theatrical genre that "lets the audience into" the world of fiction (e.g. the happening – style, environmental theater of the 1960's and 70's), the viewer has little if any initiative or control. A change in the balance of power in the theatrical interaction, and the introduction of initiative and control into the viewer's functioning, will be necessary if the theater is to appropriate performance symptoms from the world of virtual simulation. This will require the ability to make do with tracing the potential for action within the representative world itself, as well as the direct, unmediated experience felt by the spectator.

The nature of space in the theater, unlike that of the virtual

[1] Most of the arguments presented here are inferred from Laurel's discussion [5].

world, is what determines the relationships among those who take part in the theatrical situation. Hence, a theater that tries to assimilate a virtual mode of thinking, must adopt a different conception of space. To this end, we shall propose a concept of space whose dominant characteristic is taken from virtual space. This is "liquid architecture".

'Liquid Architecture' in a Virtual Space

The space of a virtual universe possesses certain basic features, which are in part theatrical and in part alien to the theatrical conception. As in the theatrical space, here, too, 'towns' can be squeezed into 'rooms', landscapes are expressed in architectural terms, boundaries can change and the same expanse can be given various definitions. The qualities of both virtual and theatrical spaces contradict some of the basic parameters by which we decode actual space. However, the fluidity of the virtual space is also – and mainly – the result of the interactive relations in the world of digital simulation. Marcus Novac describes it: "Liquid architecture is an architecture that breathes, pulses, leaps as one form and lands as another. Liquid architecture is an architecture whose form is contingent on the interests of the beholder…"[7](p.264).

'Liquid architecture' undergoes a process of ongoing development and its identity is continuously revealed through its existence. This mode of architecture no longer contents itself with dimensions such as space, form, light and all the other elements that make up an architectural object in the world of reality. An attempt to modulate a fictional world thus characterized and existing together with, and as part of, the actual reality, is the key to a theater that happens within a virtual meaning. The possibility of a virtual theatrical situation is thus one where only the viewer can be its point of departure and 'center of gravity'. It is the viewer who must navigate through an actual space, fitted with virtual applications, which he may perceive and operate as a fictional space with "liquid" qualities. A situation such as we have described could exist with further development of the *Digital Labyrinth Theater*.

The Digital Labyrinth Theater

The '*Digital Labyrinth Theater*' project is to be presented between the 22 and 25 October 2002, as part of what is regarded as Israel's most important fringe festival – The Acco Festival. Initiator and coordinator of the project is the artist Galit Eilat.[2]

Eilat explains her choice of the labyrinth as a theme, by her quest for the experience of navigating through virtual space. The interactive navigation demands that the viewer follow the artist's line of thinking and decode certain clues in order to move on and watch the work in its entirety. The project is made up of several works of digital art, some of which have been shown before, all by renowned artists: the British artist Stanza, Gregory Chatonsky, the Israeli artists Oren Zikerma, Moshun Zer Aviv and Regev Contes, and the video artist Eddo Stern, the Americans Mark Lafia and Teo Spiller, and a work by Marc Voge and Younge-hae Chang. The works will be displayed in a single space, which will be designed as an advanced technological space so that the encounter between it and the architecture of the Old City, where the Festival takes place, will produce an intriguing visual tension. The room will be almost dark, the only sources of light provided by the computer screens and the projectors. The visitors will enter a space whose limits are not clearly defined and move along by looking at, and interacting with, the works. The interactive relationships in the project are reflected both in some of the individual works, and in the overcall course of wandering freely inside this unconfined enclosure. The free order of the spectator's route of navigating through the space, will affect the way in which she/he perceives the project as a whole.

Eilat explains that by choosing the image of a labyrinth, she intends to reflect the hypermedia technology in the structure that organizes the information, and through the roaming experience the viewer undergoes while making her choices in a sequence of hyperlinks inside the virtual space. Essentially, the project is an attempt to test the boundaries of the theatrical medium.

On the surface, we do not seem to be in the presence of what one might call a "digital theater". On the other hand, the *Digital Labyrinth Theater* will hereafter be presented as an event that nonetheless poses the fundamental conditions for the existence of a virtual theatrical situation. We shall also attempt to determine what is still required in order for this project to contain the theatrical and virtual aesthetics jointly and concurrently.

'Virtual Illusion' and Space

The relations between the virtual world and reality, and between the theatrical fictional world and the actual world, are substantially different. Thus, the illusion of a virtual reality is not the same as the theatrical illusion. Therein lies the different aesthetic bases – that of computerized simulation and that of the theater.

The virtual space is designed by mathematical and algorithmic signs. Thus, with regard to the material stage, it is totally different from actual reality. On the other hand, great efforts go into an attempt to design logical links that will resemble the actual world as much as possible. [1] On the operative level, as far as the characterization of space is concerned, virtual thinking constitutes an attempt to bring users into the virtual world. "To be there" (as in the theater), but there alone. In theatrical terms, the illusion of reality in VR is a *delusion* – "complete oblivion" of the actual reality. By contrast, the world of theater is made of reality materials and rests on logical links, many of which do not meet the logical criterion for deciphering the phenomena of reality (talking in aside to the audience while the other actors on stage "do not hear"; saying "moon" and the time on stage turns into night). However, the fundamental requirement in theatrical aesthetics is the co-existence – parallel and simultaneous – of both worlds, the fictitious and the actual, the "here and now", and the "there and then", while the relations between them remain flexible and vary constantly [4]. The viewer is required to enter a state of illusion, not of delusion. The literal, primary translation of the common presence of both worlds, is their separate, or not, existence, in one single space, no matter how divided.

The synthetic image represents a graphic reality, a world reduced to geometry, created by computers and their operation. One implication of this notion is that the user's departure from the world of digitized simulation, the position into which he is flung when leaving the delusory position of the virtual space, his "alienation" from the virtual world – are but an awareness of, and preoccupation with, the operating system of the computer software. The user 'moves' from a "delusory" wandering through the virtual action space, to a cognitive activity in the operating system. Manovich draws an analogy between the aesthetics of this new medium, which regards the user's experience as a series of shifts between the roles of spectator and user, one who perceives and one who acts; and the outgoing presence of the communicative channel in the message, the theatrical "alienation" in the style of Brecht [6]. This comparison is deficient. According to Brecht's strategy the viewer may indeed 'approach' or 'move away' from the actual reality during her "perceptual stay" in the world of fiction. One may compare this situation with the user's range of action inside the virtual space. Going in and out of the virtual world, lies between a space that has an "architectural model" and a space with a "sculptural model". In Novac's words: "Á space modulated so as to allow a subject to observe it but not to inhabit it is usually called sculpture. A space modulated in a way that allows a subject to enter and inhabit it is called architecture."[7] (p.259).

An aesthetic perception that combines two such models does not admit a common presence in the same space; nor can one talk of

[2] Galit founded *digital art lab,* an Israeli center for digital art.

a space-relation between virtual and actual. Such an aesthetic perception implies a different concept of space.

In the theatre, the movement is always between architectural models. The spectator enters an actual place; the venue of the show, and the theatrical situation unfolds inside and in relation to that space. The spectator is never expected to observe the world of fiction as a complete outsider, "through the operating screen". Such observation would empty the situation of its theatricality. On the other hand, admitting the viewer into the fictional space, not just as a matter of perception, but in actual fact, while both worlds continue to co-exist parallel and simultaneously, is indeed the primary and necessary pre condition for a theater in a manner of a virtual world. How, then, can two such different characterizations be accommodated?

The history of theater has seen attempts to take viewers inside the world of fiction. What was missing from these earlier trials was that virtual component which dictates an interactive relationship that keeps altering the definition of space. They lacked a situation in which not only the nature of the space would determine the characterization of relations – as it does in all theatrical situations, but in which space would became transformed according to the interactive interaction taking place "inside" it.

Thus, in a theatrical concept with a 'virtual thinking', the movement of the user to and from the virtual worlds, that process which thrusts from a virtual space with architectural qualities to an interface with sculpted attributes– must change, and adjust to the theatrical experience. The viewer's "circular movement" – approaching the world of fiction, then drawing away from it – must flow within a total architectural space. Moreover, the two architectural spaces within the whole – the actual and the fictional – must co-exist, while the fictional space varies in accordance with the balance of changing powers in the situation.

"Virtual Theater" – a Spectator Navigating a 'Liquid Space'

The art of installation is a mixed discipline [3]. Here, as in other elements, the installation has a respectable theatrical lineage. The relationship between installation and theater, just as between the theater and the world of computerized simulation, is based on give and take. In an installation, the concept of space is a compound of art and everyday life, a dynamic medley based on reality elements, again after the fashion, and as an extension, of the theater. However, the installation space can also function differently. Not merely confined to the limits and form of the object as such, it can evolve and develop as the viewer's consumption process advances, and during the time it takes. The installation may at times assume its identity in accordance with the beholder's interests and wishes. Such characterizations are, essentially, virtual. It would therefore make sense to search for the answer to a theatrical space that "thinks" virtually, in a certain mode of organizing a group of installations in a single space, based on their combination.

The *Digital Labyrinth Theatre* is made up of several installations and includes interactive as well as reactive elements. The complete space of the project is *one-space* type – an actual space without separation between performers and spectators – unlike the *b-space* type, which maintains the traditional division between stage and audience. The *one-space* type is a pre-condition for the existence of an interactive relationship in a theatrical situation. The space in the *labyrinth theater* includes the various fictitious objects formed by the installations, with no clear delimitation between the objects themselves, as well as between them and those who watch them. Thus, the project allows for an interactive relationship with viewers both on an individual level, and in the project as a whole. The viewer's freedom to roam in and between the works alters the 'labyrinthian' character of the project. It is the interactive dimension that enables the space concept of the whole project to assume the characteristics of "liquid architecture".

In the *digital labyrinth theater* project the space has a potential that differs from that of digital simulation worlds, from which one exits onto a computer screen with its sculptural qualities. Its potential is also different from that of a possible blending of the Internet and the traditional theater situation. These situations lack the aesthetic theatrical element of a common presence in an actual space, in the sense required by the theatrical illusion. A space like that of the *digital labyrinth theater*, which is composed of virtual and non-virtual parts, all in the same actual location, can provide the necessary conditions. Here, the move from one "fictional" world to another can still be achieved inside a "complete" fictive world whose space is architectural.

Provided the viewer is guided by stimuli implanted in various components of the project, such conditions could allow him to create a world of fiction to suit his desires and imagination, and in relation to the actual space. However, as long as the different works that make up the project do not unite on the perceptual and narrative level, other than existing together in a single actual space, and beyond the overcall concept of a labyrinth, the project will fail to provide the conditions necessary for the creation of a comprehensive world of fiction. By planting stimuli in the works – stimuli that can come together, in various forms and various linkages, to produce a perceptual and narrative completeness, one would be able to create a 'liquid' world of fiction. The visitor would be expected to navigate the labyrinth, select a "link" and follow it; or otherwise change course and hook up with another "link". By opting for a particular work as a starting point, he can be thrust towards realms into which he will weave the other works. This would be made possible thanks to a variety of stimuli which would cause the spectator to move from a situation in which he creates a "story" and plays a role in it, to one where he will trace the various options that unite the elements in space into one complete story. From the concept of art as a consumable object, the project has to move to an art that shows itself in the field lying between the viewer and a sequence of stimuli.

Heavy demands are made upon the viewer in such a situation. She is the protagonist of her own, self-created world of fiction. There is no 'pre-existing meanings' she must discover, but a potential for her to find and 'produce' meaning all by herself. The illusion created here would reside in the relation between the compound of digital and non-digital images, the synthetic and the actual, as organized into a fictional entity on the one hand – and the actual space in which the individual viewer navigates.

Flesh and blood actors may disappear from the new concept of a theater that assimilates the virtual domain of meaning, but a spectator navigating inside an actual space, and succeeding in transforming it and embodying with it a fictional world, in a space that breathes together with him and changes accordingly, is the proposed basis of the new theater concept. A 'virtual theater' is indeed the theater of a lone beholder in an actual space, where virtual and non-virtual elements act side by side.

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Modeling Intention in Creative Systems: Logics and Generative Art

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ABSTRACT

This paper examines the possibility of modeling intention in creative computer mediated systems. It discusses the way that I have employed logic and logic programming as a significant mechanism that has helped me develop certain kinds of generative art towards this end. Central to the approach to participant interaction is an extension of drawing practice which uses unhindered human movement within a motion tracked space. Central to this process is the absence of a physical connection between human and computer.

1. Introduction

The paper reports on work done in the domain of interactive art to investigate the ability of a computer system to facilitate exploration of the processes occurring from the initial intention to the observable realization of that intention. Observable referred to here relates to the acknowledgment that an intention has occurred and that phenomena exist that represent the realization or articulation of that intention. The work is described in the context of generative art systems, based on logic programming, that have been extended to include interaction with the participating audience.

The authors' approach to these problems is described. This approach is an extension of drawing practice which uses unhindered human movement within a motion tracked space. Central to this process is the absence of a physical connection between human and computer.

2. Generative Systems and Logic

To many, music is the highest art form. The purity and yet the power of these abstract structures in time seems to cross cultures and ages and are often at the centre of, or perhaps pointedly excluded from, religious worship. Not surprisingly, painters quite frequently aspire to being composers or musicians. Formally, the distinction between seeing and hearing aside, the key difference between painting and music might be seen to be the presence of time as an integral element or dimension. Verotov's characterization of his film The Man with the Movie Camera as "an experiment in visual music" perhaps captures the visual artist's interest in time [1]. However, other influences have also been afoot in the 20th century. For example, in work that uses geometric or other systems, it has been common to produce series of works that often have a natural sequence. It is only a small step to think of them as stills from a movie. Another closely related development was the early use of computer programs to *generate* drawings. Generative works of this kind lend themselves to the automatic generation of a series because the computer program is a kind of general structure or form that can apply to a class of works, each a variation of another. It seems natural to extend such explorations to time-based visual art. See for example, *Sydney* by Edmonds (fig. 1) [2].

There are a number of classic mechanisms that artists use in making generative work. Variations on genetic algorithms are, perhaps, the most common. These are modelled loosely on scientific theories about life and the development of new life forms. Selection of the fittest, or elimination of the weakest, is an essential part of these processes and the application of pseudo-random numbers to selection or, in interactive works, selection by the audience or participant are normal. The work described here is quite different in its inner

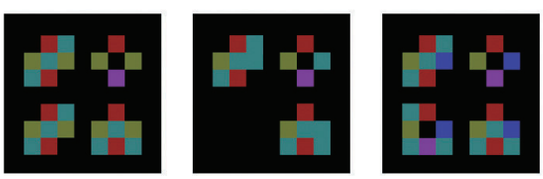

Figure 1: Stills from Sydney (1995) by Ernest Edmonds

structure to such "genetic" works. This work is constructed by specifying rules that determine how the generation of images should progress. These descriptions do not contain any random element and are not intended to model any particular scientific theory, either loosely or tightly. The mechanisms discussed have been developed purely to support developments in the making of time-based art and no meaning for them is claimed beyond that. The paper does not attempt to describe any kind of scientific, aesthetic or other motivation for this work. This account simply confines the discussion to the methods for constructing generative time-

based art works, interaction with them and the search for understanding intention.

In generative time-based art, the explicitly defined part of the work is the structural element including, specifically, the *rules* that are to be used to determine in which order and at which pace the image sequence should develop. Although random or pseudo-random elements can be employed, in this work it is entirely deterministic. The complexity of these works leads to enough uncertainty without adding randomness as well. In comparison to music, this work has a relationship to the early works of the composer Pierre Boulez and others who took the serial music concepts to a more extreme level than Schoenberg by including more musical elements in the structures that the serial forms defined. In this work, just as the images have an underlying order about them, based on geometrical and colour relationships, so the progress in time also has an order based on the generating logics. The exception to this determinism comes with the addition of *interaction* as an element of the work.

3. Interaction and Intention

A series of experiments are being conducted that explore the relationships between movement and external representations of this behavior. This work is base on the development of interactive generative systems.

Heron (2002) by Edmonds, for example, is a work that consists simply of a set of coloured vertical stripes that change in time. Physically, it is a projected image on a sheet of translucent plastic hung in space.

In this case, the image is a set of coloured stripes and the nearer the person is to the piece the narrower the stripes become. This creates a sensation of the work retreating as the viewer approaches it. In addition, the rate of change is, up to a point, directly proportional to the amount of movement (e.g. waving) that is detected. However, too simple a relationship is not particularly appropriate. One point is that there is always some movement (using y=Mx+C rather than y=Mx to relate image rate of change, y, to person movement, x). In addition, when the degree of person movement reaches a particular level, the images revert to the slowest level (**if** x>*Limit* **then** y=C). In effect, the piece does not "like" wild articulation. This notion is borrowed from Edward Ihnatovich, whose piece SAM, moved in relation to sound but stopped if things became too loud [3].

As the day progresses, *Heron* builds a simple record of events as a vector in which the degree, extent and variation of movements in front of it are represented. Meta-rules make use of this data to modify the behaviour patterns, for example, by lowering the threshold, *Limit,* which is used to define the degree of movement to which it will not respond. One could say that *Heron* can become 'tired' of people jumping and waving in front of it all day long.

The experiments are based on analysis of behaviour patterns observed by the system in the audience participants who interact with the work. The logic of the generative system is being modified by the behaviour of people who are thought of as communicating with it. The process is one of the art work system inferring intentions or meanings in the movement of the human participants and hence engaging with them in a kind of primitive dialogue. From the human point of view, we can see the process as one of trying to control, or partly control, the behaviour of the system by expressing intention through movement.

4. Conclusion

The use of logic programming to provide a way of composing time-based generative art has the great advantage over procedural programming methods. For this kind of work, it is very concise and productive in enabling thinking about the work to include a significant investigation at a structural level. Furthermore, it is relatively natural to extend the method to include interactive work and, with the help of meta-rules, interactive work that performs differently over time according to experience. As the artwork learns, it changes the way that it *develops* rather than simply the way that it employs stimulus-response rules to govern its performance. The interactive art systems advocated by Cornock and Edmonds [4], and others, can now be realised and developed in ways not imagined thirty years ago.

Current work is described that involves investigating a method to capture/articulate the "space in between" an intention and the realizable object. This includes the construction of mechanisms to extend the control of a human in the context of a computer system and the development of a language of articulation that assists the realization of an intention.

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