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Multimedia spatial organization: Towards a different type of cultural economy

ABSTRACT

This article attempts to establish analogies between the recent introduction into architectural thought of notions such as the human body movement, events and scenarios, and the development of navigation and interaction principles and conventions in the computer world. The study of the human–computer interface contributes to an understanding of the major role of the computer screen as a point of convergence of different representational forms, and the emergence of new ones belonging to the digital culture. The compositional structure of interactive multimedia works is on the one hand a visual, spatial composition and on the other a narrative and navigational structure.

KEYWORDS

multimedia
interface design
space organization
space conception
interactivity
navigation

INTRODUCTION

As the distribution of all forms of knowledge and culture becomes computer-based, we are interfacing with a culture encoded in digital form, and the computer screen emerges as a cultural interface (Manovich 2001). Contemporary architectural thinking moves from the conception of an absolute and

objectively defined space to a subjective approach where human experience is the basic element for attributing sense to space. Thinking space by means of events and scenarios seems to prevail over the static entities of traditional architectural conception. The introduction to architectural education of the study and analysis of human–computer interface design contributed to a better understanding of the major shifts in the conception and design of space due to communication and information technologies.

This text attempts to establish analogies between the recent introduction into architectural thought of notions such as the human body movement, events and scenarios, and the development of navigation and interaction principles and conventions in the digital environment. Bernard Tschumi emphasizes the role of the movement of the human body in generating spaces produced by and through its movement. He considers that human movement constitutes the intrusion of events into architectural spaces. 'At the limit, these events become scenarios or programs, void of moral or functional implications, independent but inseparable from spaces that enclose them' (Tschumi 1996: 111). On the other hand, Antoine Picon (2003) considers a growing pre-eminence of events and scenarios over static entities in contemporary architectural design. Under the influence of computer and communication technologies, architectural form becomes similar to a cross section in a continuous flow, similar to an event.

Our approach to these new challenges of space conception is focused on the following thematic axes:

- The study of the different levels of organization of the screen space as an environment of communication and representation
- The development of a new codification of communication based on the modalities of interaction (gesture, index, metaphors)
- The comparison between the three-dimensional (3D) organization of virtual space and the multi-layered space of multimedia data organization
- The analysis of the human–computer interface as a point of convergence of existing cultural forms and the emergence of new ones, inherent in information and communication technologies.

3D DIGITAL SPACE AND MULTIMEDIA ENVIRONMENT

During the Renaissance, a frontal view conception of space was developed, together with the invention of the perspective representational model. Since then, the basic modalities of space conception and exploration, which at the same time produce a spatial discourse, have been as follows:

- The frontal contemplation of a Renaissance viewer
- The view of the nineteenth-century panoramas that evolved in the information-era embedding of the viewer in digital environments
- The trajectory through space that evolved from the nineteenth-century walking observer (*flâneur*) and the modern-movement architectural walkthrough via the spectator movement in kinetic and installation art, to the 3D digital environment walkthroughs.

Walter Benjamin has analysed the events and social transformations that formed a new kind of observer in the nineteenth century (Buck-Morss 1991). This new urban space perception and experience is characterized by fragmentation and multiplicity. Michel de Certeau makes

the distinction between two different approaches of a familiar space mental description: the 'trajectory' and the 'map'. The trajectory description is based on a mental simulation of movement through the space, discovering and defining space relations and qualities. The map approach is based on an overall cognitive space conception (De Certeau 1984).

The great majority of architectural experimentation with digital technologies has been orientated towards a 3D environment approach, based on biological or mathematical models, as well as on the mobile camera representation of space. Navigation in 3D space is based on cinematic codification to create a subjective viewing simulation. 3D space is homogeneous and consistent. In the 3D environment and in interactive installations we find again physical space exploration modalities such as trajectories and panoramas.

Despite more than two decades of development, space organization and conception in interactive multimedia has been given very limited attention. Multimedia space is the product of what I call 'the digital homogenization' of different representational media. The crucial step that digital technologies have enabled is the homogenization of all media into a single computer environment, thus creating a digital composite space. Digital compositing allows for the control of the transparency of individual layers and the combination of potentially unlimited layers of information. What is most important is that homogenization permits the creation of a new object that can keep its initial modularity.

The 1978 Aspen Movie Map designed by the MIT Architecture Machine Group is acknowledged as the first interactive multimedia-navigable space application. Still images (16mm film frames) were taken towards the four cardinal directions at equal intervals along the main streets of the city. The program used the metaphor of driving and allowed the user to 'drive' through the city of Aspen, Colorado in two distinct environmental conditions (summer, winter) and to obtain information about specific buildings and monuments that he or she passed on his or her way. The Aspen Movie Map, as well as the 1990s Apple QuickTime VR technology, was based on the idea of constructing a large-scale virtual space from still images or video of a physical space. This is a new approach of creating a digital space based on the sampling of the continuous urban or architectural space. It opens up unique spatial experience possibilities, not available with 3D computer graphics. Multimedia exemplifies a different type of cultural economy and aesthetic forms.

As a technique of coexistence of different elements or multiple layers, digital compositing has its roots in collage painting, optical printing in cinema and the electronic editing of television and video image. The shift in digital communication, on the one hand, seems to strengthen already existing media forms, while on the other acting as a catalyst for new forms. Concepts and techniques invented by avant-garde movements at the beginning of the twentieth century became embedded in the commands and the interface metaphors of computer environments. The artistic preoccupations of twentieth-century artists, such as escaping from the two dimensions of the canvas or the screen surface and the coexistence of different media in the same picture, today find a new dimension in digital technology.

INTERACTIVITY AND NAVIGATION

I attempt to establish analogies or divergences between moving in physical space and the contemporary approaches of navigation and interaction in a digital environment. We believe that the movement of the user in the digital

space is a basic characteristic of the computer culture, and that digital space is always a navigational space. There are two different ways of moving in digital space:

- simulating movement in 3D virtual space, manipulating space data via a screen interface or embedding devices
- moving through the multiple layers of data and different media on the screen of a multimedia environment.

Space design in a multimedia application is characterized by interactivity functions, hierarchical or non-hierarchical organization, and modularity. Exploring a multimedia space allows the user to simultaneously unfold the logic organization of the content. Design for interactive multimedia includes two main procedures: On one hand, we have the spatial composition of the surface of each screen and the time-based composition of audio-visual events. Parallel to this, we have the structure of the interactive navigation.

In a multimedia environment, the user moves through the multimedia space one step at a time, exploring each element, enjoying its media sources (text, video, animation, sound) and then moving on to the next one. He or she establishes an itinerary, and thinks in terms of performing actions such as indexing, selecting from menus and pointing at objects, thus establishing a third dimension in his or her mind, that of the interactive narrative that combines both cinematic and diegetic qualities.

When the concept of interface first began to emerge, it was commonly understood as the hardware and software through which a human and a computer could communicate. As it has evolved, the concept has come to include the cognitive and emotional aspects of the user's experience as well. More recently, artistic disciplines such as industrial, graphic and sound design have been introduced into the interdisciplinary design procedure. Brenda Laurel (1993) investigates the interdisciplinary nature of design by incorporating techniques from artistic disciplines such as drama and theatre and analysing the poetics of human–computer activity.

CREATIVITY AND SELECTION

During human–computer communication in a multimedia environment we are forced to oscillate between the roles of a viewer and a user, shifting between perceiving and acting, making choices. This oscillation constitutes the cyclical organization of the digital space user's experience. At the same time the screen alternates between representation and control, between an illusionary universe and a set of controllable elements.

The fluid and dynamic character of the digital space gives birth to a new mental experience, that of interactive navigation. This experience is an association of glance and gesture that is operated by the program in the data space. The virtual displacement in the multimedia environment is based on the organization of different possible paths and the codification of this displacement. This codification uses metaphors of space organization and has developed a new digital ergonomy and identification. Designing interaction is diagramming the potential flows of possible events.

Interactive design is programming, even when the details of the actual mechanism are hidden. Computer devices such as the mouse and electronic stylus have re-inserted the analogue gesture of the human hand. However,

at the same time this gesture works on the data level affecting the organization of the information. Thus, between the glance and the movement of the hand is positioned the language, the symbolic organization of information (Couchot 1988). The French anthropologist André Leroi-Gourhan (1993) argues that a technique is at the same time tool and gesture. Tool and language are two poles of the same mechanism, since we construct a tool that we have already mentally conceived.

The new logic of the computer screen makes space as important as time. The possibility of embedding hyperlinks adds other spatial and temporal dimensions. The typical use of a hyperlink is to establish a relation of an element inside the space of the screen surface with information displayed outside it. This information can either fit in the screen or be presented in a different window entity. The new spatial dimensions can be defined as follows:

- spatial order of layers in a composite 2 1/2-D space
- virtual space constructed through compositing 3D space
- 2D movement of layers in relation to screen frame
- relationship between screen information and linked information in the adjustent windows (2D space).

Hyperlinking separates data from its structure. The same data can be endlessly assembled in new structures. Parts of a single document can exist in physically distinct locations, i.e. a document has a distributed representation. The design of space functions is characterized by interactivity, non-hierarchical organization and modularity. During the production procedure the various elements are adjusted stylistically, spatially and semantically into a whole. The user can move the elements within the program limits. As a general operation, compositing is a counterpart of selection.

The modern HCI, as we know it today, functions with principles such as direct manipulation of objects on the screen, overlapping windows, iconic representation and dynamic menus. These interface operation conventions are today broadly accepted and constitute a cultural language of their own. Each of the media forms used contribute with its proper way of information organization, correlating space and time and structuring human experience into the emergence of the modern HCI. Each has its own grammar and its own metaphors, and offers a particular physical interface. As a result, a computer screen can present the user with a practically unlimited amount of information despite its limited visible surfaces.

CONCLUSIONS

New media spaces are always navigable spaces, and they represent a key form of digital design. Information and communication technologies have spatialized all representations and experiences, while digital narrative is equated with travelling through information. Navigable space is already an accepted and familiar way of interacting with any kind of data. There are two different prototypes of navigable space. The first one concerns 3D representation of physical, virtual and abstract data cyberspace, and is strongly influenced by the moving image conventions. The second one is that of multimedia exploration and is more influenced by the typography, graphic and painting traditions.

Navigable space in multimedia applications represents a new challenge. Rather than considering only the geometry and logic of static space, we must

take into account the new way in which space functions in computer culture, as more of a trajectory than an area. Multimedia space is a space of digital composing in which different spaces are combined into a single seamless virtual space.

The human–computer interface imposes its own logic, and models human experience and design procedure. A designer has the opportunity to freely mix different media forms and conventions following organizational strategies available for use in new contexts. A multimedia environment requires us to combine modalities and even to create new ones. The compositional structure of interactive multimedia works is on the one hand a visual, spatial composition and on the other a narrative and navigational structure.

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