Being There: Architectural Metaphors in the Design of Virtual Place

Rivka Oxman

Faculty of Architecture and Town Planning, Haifa, Israel, 32000
http://www.technion.ac.il/~oxman

Abstract. The paper reports on a research program to define the issues and strategies involved in the design of virtual architecture. Issues and categories of virtual architecture are identified and classified. An approach to the design of virtual place is derived from a large body of emerging literature as well as from the analysis of case-studies. We demonstrate and discuss how paradigms of physical design may be applied to support the needs of design for cyber-place. We attempt to define intrinsically digital possibilities for interface design that are not based upon a direct analogy to physical space. The findings in the form of alternative development possibilities and design guidelines may provide a guide to the field of virtual architecture, to its definition, design issues, and potential strategies.

Keywords. Cyberspace, cyber-place, virtual architecture

Introduction

Virtual architecture is a generic term connoting the generation of architectural effects, such as spatial experience, within computer-mediated environments. Despite its relevance to all computer media, the term has come to be strongly associated with Web development in which architectural analogies are employed to provide a sense of reality to various classes of sites. Within recent years the analogical approach to the design of such Web functions as commerce and image display/exhibition have proved so successful that architectural places in the Web are evaluated on the basis of the numbers of "visitors" per day.

Virtual architecture is not only an established phenomenon, but within the context of information architecture it has become a new genre of design problem. Current approaches to the design of information space are based on the common and prevalent "document metaphor". However, future design applications of virtual architecture will seek to find new and more appropriate interface designs for virtual functions. In approaching the design of virtual places these future approaches may introduce known paradigms such as simulation-based design, typological design and metaphor-based design in order to achieve architectural reality in virtual space.

This paper reports on a research program to define the issues and strategies involved in the design of virtual architecture. The research included a comparative and critical analysis of existing case studies. We begin with the identification of issues and propose a classification of the categories of virtual architecture. We then present an approach to a theory of virtual place derived from a large body of emerging literature as well as from the analysis of case-studies. We demonstrate and discuss how paradigms of physical design may be applied to support the needs of design for cyber-place. Furthermore, we identify some of the pitfalls of a direct analogy to physical design. We attempt to define intrinsically digital possibilities for interface design that are not based upon a

direct analogy to physical space. The findings in the form of alternative development possibilities and design guidelines provide a comprehensive guide to the field of virtual architecture, to its definition, design issues, and potential strategies.

The research was carried out in the framework of a research-oriented educational program as part of a long-term general program to integrate digital design studies as a supplemental and theoretical contribution to design studies in the architectural program.

Virtual architecture: working definition and issues

Virtual architecture is the computer-mediated generation of architectural experience. It overlaps with subject areas using terminology such as virtual reality, cyberspace, cyber-place, cyber-architecture, and web technologies. While less constrained technically than virtual reality, it is dependent for imaging capacity and level of interactivity on more technically dependent fields. The emphasis of virtual architecture, therefore, as a research and development area is on the exploitation of the analogy of architectural space, structure and experience as a contribution to the understanding, appeal and utility of computer-mediated environments.

Basically, the components of virtual architecture are image and information content; the symbolic content conveyed by them; and the nature of the media of interactivity appropriate to the architectural analogy. Each of these three major ingredients was defined and illustrated in the analysis of case studies.

As a general design problem virtual architecture raises a broad set of issues that include both the theoretical (the need for verisimilitude and the production of artificial reality; the nature of the experience of place) as well as the psychological (properties of navigation in space; self-orientation; the psychological implications of interactivity; the value of structure, hierarchy, the combination of visual and textual experience, etc.).

In addition to these more or less intrinsic issues, the research involved a set of questions related to the implications of virtual places as a medium for social interaction and collaboration. The possibility of "being there" in processes of interaction and collaboration while experiencing the sense of social physical presence raised a further set of interesting design issues. Among these are the implications of virtual architecture as a medium for the creation of social value, e.g. of knowledge.

Virtual architecture: categories and case-studies

The research provides a broad perspective upon a range of categories and case-studies of contemporary virtual functional types.

a. categories of virtual places:

We have studied in detail a full range of contemporary virtual places such as commercial facilities (sales); exhibition-museum facilities; stock exchanges; professional offices, recreational-leisure-entertainment facilities; etc. Furthermore, we have attempted to extrapolate from these contemporary applications to the future implications of virtual architecture.

b. categories of analysis

The following categories were explored and analyzed in the case-studies: medium and type of interaction, use of senses, means of activation, form of expression of presence and participation, expression of space and time, expression of social presence, media and forms of navigation and orientation.

c. design principles from other forms of applications

In addition to virtual architecture, we have

examined design principles in computer games such as Diablo2, Wolfenstein, Quake, Tournament, Dune2 etc. and have studied conceptual experiences in films such as Matrix, The Thirteenth Floor, Matrix Reloded, etc. and we have examined design in information-based environments such as forum and chat rooms.

Some paradigms of cyber-place design

The 'document-based' metaphor has long been the main metaphor employed in the design of web-page communications. However, "Cyberspace" (Gibson, 1984, 1986, 1987), or the medium of information space is different from the medium of physical space. The design of physical space has developed unique strategies. Can these strategies be applied to the design of Cyber-places. The following paradigms were tested and critically analyzed with respect to their validity as design approaches in the design of places in cyberspace:

a. Metaphorical-based design

Metaphorical design attempts to duplicate the experience of the real space of functional experiences; it is the most common of Cyberspace design strategies. This strategy can be found in the design of "architectural building types as well as urban experiences". Metaphorical based design was found to be a useful paradigm to support orientation, navigation and browsing. We can demonstrate the potential of this strategy in the design of such applications as the modeling of complex urban environments that provide navigational experience at different scales such as domestic and urban scale.

b. Typological-based design

Typological design is here defined as the symbolic, rather than functional, content of architec-tural space. For example, in Cyberspace there is no need for structural elements. Since structure has lost all but it's visual and symbolic meaning. Arcades and other urban typologies can be used in the design of virtual architecture in order replicate the experience of recognized spaces. This is particularly relevant with respect to the definition of movement space, and a means for going beyond the scrolling facility of document-based environments. Structure symbolizes the analogical realm of space and time in digital space and acts as an interface for movement.

c. Simulation-based design

Simulation-based design simulates behaviors according to parameters and integrates them in the design process. In Cyberspace there is no need to respond to climate, gravity or weight. Therefore the concept of simulation-based design is free to become uniquely digital. For example, a place in Cyberspace can be activated and change its dimensions and shape according to the number of users who "occupy" the space. Volume and shape can become visual cues to simulate habitability. This is particularly relevant to the issue of social presence. In many chat-room applications we can read information such as the participants list, the number of active participants, the participants that have joined and left the forum, etc. Usually this information is treated by techniques of listing (information-based design). An "Internet Café", for example, can grow or become smaller thus reflecting the number of its participants, and the potential for social interaction.

In our work we have demonstrated how such information and data constructs can be translated to, and implemented by, dynamic physical simulations. We demonstrate a flexible 3-d space that is responsive to the number and the presence of its virtual participants.

Summary

The research provides a broad perspective upon a range of virtual functional types. It provided a means to critically compare design guidelines as they differed by functional categories. The design issues of different e-function categories differ substantively with respect to the environmental requirements of virtual place. These differences can be expressed in the form of a set of design guidelines for classes of e-place.

In exploring the suitability of three design paradigms for the construction of virtual space (metaphorical, typological and simulation) we have found that each of these approaches stimulates insightful innovation with respect to the potential of truly digital environments. However, while conventional design approaches to spatial design are useful, they are also limited in enabling the invention of non-experienced based "digital realities". In design they offer a good point of departure for more experimental and truly digitally driven design approaches of the future.

We have attempted to extrapolate from contemporary applications to the future implications of virtual architecture. In attempting to build applications based upon our analyses we find that there are limitations to the architectural metaphor just as there are limitations to the document metaphor. Obviously certain kinds of hybrid environments and interfaces will emerge in order to make the architectural metaphor more than just a monotonic nostalgic and convenient attachment to the visual world.

The cutting edge is probably elsewhere. In our brief sampling and analysis of cinematic experimentation and game-production there is a new level of verisimilitude in the modeling, a new level of dynamic interactivity, and a new pacing in the time-frame that is shared by cinema and gaming. The next step is obviously in the direction of hybridization –perhaps through divided screens–

in order to enable the physical metaphor to incorporate and interact with such facilities as information and data environments.

The nature of Cyberspace as a social experience is also a cutting edge research field. How can we share place in digital environments?

However, the name of the game is palpability. Digital place will not be simply a reproduction of visual experience, but a unique and powerful experience in itself that we will learn to use, need and want as Gibson tells us.

"…he still dreamed of cyberspace……he'd see the matrix in his sleep, bright lattices of logic unfolding across that colorless void, and he'd cry for it……"
William Gibson, Neuromancer

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