

CONTEXTUALIZATION AND EMBODIMENT IN CYBERSPACE

YEHUDA E. KALAY, PHD
Professor of Architecture
University of California, Berkeley

Abstract

The introduction of VRML (Virtual Reality Markup Language) in 1994, and other similar web-enabled dynamic modeling software (such as SGI's *Open Inventor* and *WebSpace*), have created a rush to develop on-line 3D virtual environments, with purposes ranging from art, to entertainment, to shopping, to culture and education. Some developers took their cues from the science fiction literature of Gibson (1984), Stephenson (1992), and others. Many were web-extensions to single-player video games. But most were created as a direct extension to our new-found ability to digitally model 3D spaces and to endow them with interactive control and pseudo-inhabitation.

Surprisingly, this technologically-driven stampede paid little attention to the core principles of *place-making* and *presence*, derived from architecture and cognitive science, respectively: two principles that could and should inform the essence of the virtual place experience and help steer its development.

Why are the principles of place-making and presence important for the development of virtual environments? Why not simply be content with our ability to create realistically-looking 3D worlds that we can visit remotely? What could we possibly learn about making these worlds better, had we understood the essence of place and presence?

To answer these questions we cannot look at place-making (both physical and virtual) from a 3D space-making point of view alone, because places are not an end unto themselves. Rather, places must be considered a locus of *contextualization* and *embodiment* that ground human activities and give them meaning. In doing so, places acquire a meaning of their own, which facilitates, improves, and enriches many aspects of our lives. They provide us with a means to interpret the activities of others and to direct our own actions.

Such meaning is comprised of the social and cultural conceptions and behaviors imprinted on the environment by the presence and activities of its

inhabitants, who in turn, 'read' by them through their own corporeal embodiment of the same environment.

This transactional relationship between the physical aspects of an environment, its social/cultural context, and our own embodiment of it, combine to create what is known as a *sense of place*: the psychological, physical, social, and cultural framework that helps us interpret the world around us, and directs our own behavior in it. In turn, it is our own (as well as others') presence in that environment that gives it meaning, and shapes its social/cultural character. By understanding the essence of place-ness in general, and in cyberspace in particular, we can create virtual places that can better support Internet-based activities, and make them equal to, in some cases even better than their physical counterparts.

One of the activities that stands to benefit most from understanding the concept of cyber-places is learning—an interpersonal activity that requires the co-presence of others (a teacher and/or fellow learners), who can point out the difference between what matters and what does not, and produce an emotional involvement that helps students learn.

Thus, while many administrators and educators rush to develop web-based remote learning sites, to leverage the economic advantages of one-to-many learning modalities, these sites deprive learners of the contextualization and embodiment inherent in brick-and-mortar learning institutions, and which are needed to support the activity of learning.

Can these qualities be achieved in virtual learning environments? If so, how? These are some of the questions this talk will try to answer by presenting a virtual place-making methodology and its experimental implementation, intended to create a sense of place through contextualization and embodiment in virtual learning environments.

The essence of place

The essences and significance of place-ness can be understood by examining it from two separate, but not independent, points of view: *contextualization* and *embodiment*.

The first point of view refers to the nature of social behavior and the role context plays in framing it (and vice versa). Environmental psychologists have long demonstrated that people respond to perceived environmental factors cognitively, emotionally, and physiologically, and adjust their interpersonal behaviors accordingly (Canter 1974, Darley & Gilbert 1985, Holahan 1986, Relph 1976, Russell & Ward 1982). For example, it is typically deemed appropriate to be naked in the bedroom, but not in middle of downtown or in a bookstore. These different behaviors derive from differences in social/cultural perceptions, not physical ones: the same space

could frame different behaviors at different times, depending on the social/cultural context it engenders.

Contextualization is derived from social and cultural—as much as from physical—settings. Such meaning is imprinted on the (physical) environment by the activities and social/cultural customs of the inhabitants. The imprint can be direct, through the presence of other people, or indirect, through the traces they leave behind after they are gone, transmitted to present-day actors in a hermeneutic manner (Champion and Dave 2002).

‘Reading’ the meaning of a place, in terms of the social/cultural conventions it broadcasts, endows it with meaning, which gives rise to a competence in the way the place is used: it helps us know how to behave in this place, which may be different from how we behave in other (perhaps similar) places. When someone misreads the place-cues, and behaves in a manner we deem inappropriate, we say s/he is ‘out of place’ (though not ‘out of space’).

The second point of view explains why the first one is so important: it follows from the philosophies of (among others) Heidegger and Merleau-Ponty, who maintained that the fundamental way in which we understand the world around us is by ‘having a handle on it’ (Merleau-Ponty 1979). For example, when looking at something (or someone), we tend—without thinking about it—to maneuver ourselves into a position and distance from the subject that is best suited for us to ‘take it in’ as a whole, as well as its parts.

Furthermore, our own corporeal presence in the environment exposes us to physical and psychological triumphs and vulnerabilities: we can be praised and honored, or get hurt and disappointed. The scrutiny of others directs our actions, as much as our own presence directs the actions of others, subject to the contextual perception of what is or is not deemed ‘appropriate’ in the specific place.

This transactional relationship between the physical aspects of an environment, its social/cultural context, and our own embodiment of it, combine to create what is known as a *sense of place*: the psychological, physical, social, and cultural framework that helps us interpret the world around us, and directs our own behavior in it. In turn, it is our own (as well as others’) corporeal presence within that environment that gives it meaning, and shapes its social/cultural character.

The sense of place is thus as much psychological as it is physical, social, and cultural. It is rooted in human social action and cultural conceptions: a *place* is a *space* activated by social interactions, and invested with culturally-based understandings of behavioral appropriateness (Harrison & Dourish 1996).

‘Placeness’ is thus the combined result of a specific physical setting, a specific social/cultural contextualization, and our own corporeal embodiment of the space. The space itself provides only the shared setting for the context and the embodiment. In return, it is the contextualization and embodiment that give the place its character or ‘quality of life’ (Moore 2001).

Types of places

Different kinds of (social) activities are affected by contextualization and embodiment in different ways. Bitner (1992) offered a typology that categorizes (service) activities according to their relative reliance on environmental qualities (Table 1).

According to Bitner’s typology, some activities requires more contextualization and embodiment than others: *self-service* activities, which typically promote only marketing objectives geared towards attracting customers, and *remote service* activities designed to cater for the needs of the consumer while minimally burdening the service provider, require relatively little contextualization and embodiment. That is why amazon.com, on-line banking and other self-service activities can successfully compete with similar brick-and-mortar establishments, but take-out food services do not threaten eat-in restaurants.

But *interpersonal* (service) activities, where the environment affects both the consumers and the providers of a service, requires both contextualization and embodiment: in this case, the environment plays a large role in framing the interpersonal relationships between the parties involved: the same interaction will acquire a distinctly different meaning in different settings.

TABLE 1: Typology of service environments
(M.J. Bitner, *Journal of Marketing*, Vol. 56, pp. 57-71, April 1992)

<i>Types of service</i>	PHYSICAL COMPLEXITY OF THE ENVIRONMENT	
	Elaborate	Lean
Self service (consumers only)	Golf Land Surf 'n Splash	ATM Ticketron Post office kiosk Movie theater Express mail drop-off
Interpersonal services (both consumers and service providers)	Hotels Restaurants Health clinics Banks Hospitals Schools	Dry cleaner Hot dog stand Hair salon
Remote service (service providers only)	Telephone company Insurance company Utility Many professional services	Telephone mail order desk Automated voice-messaging-based services

Learning places

Learning is an interpersonal activity (Dreyfus 2001): it requires the co-presence of others (a teacher and/or fellow learners), who can point out the difference between what matters and what does not, and produce an emotional involvement (a vulnerability to mistakes and the enjoyment of success) that helps students learn. Without such involvement students may be able to acquire factual knowledge but not skill—a competence beyond the mere ability to recognize facts and apply rules. Skill is based on the ability to contextualize factual knowledge and discriminate between facts that are important and those that are not, between actions that make sense and those that do not. Contextualization and embodiment thus transform a mere ‘learning’ situation into an ‘education’—the ability to infer meaning on one’s own.

The importance of place has long been recognized by educational institutions of all kinds. It is why traditional brick-and-mortar universities are so heavily invested in physical environments, designed explicitly to support co-presence (an investment that makes the physical space, in and of itself, part and parcel of the image and perceived quality of the institution).

Virtual learning environments

The advent of the Internet has opened up a new avenue for disseminating information, one that so far has been devoid of ‘place’—physically or metaphorically. Campus-less universities, like the *University of Phoenix* or the *California Virtual University*, are leveraging the economy and broad reach of the Internet’s one-to-many communication abilities, and are developing place-less remote-learning teaching modalities. By focusing solely on the dissemination of instructional materials they dispense with all the place attributes of the university: students access courseware, ask questions and answer tests in the privacy (and anonymity) of their own homes, without having to ‘come to’ the institution granting the degree, and without physically interacting with faculty, staff, and fellow students.

On the face of it, remote learning simply transforms the institutional manifestation of higher education from a physical building into a web page. But if we apply Bitner’s typology, campus-less universities do much more than that: they transform the *nature* of the service they provide, moving it from the category of *interpersonal service* into the *self service* category on the student side, and into the *remote service* category on the faculty/staff side.

This approach has undeniable economic advantages to both the institution and the students (Hamel 2000), and can bring higher education to students who would otherwise be denied access to it. But it also radically changes the rich social and cultural attributes of higher education, which according to many experts play an important role in the learning process.

One such expert is the Berkeley philosopher Hubert Dreyfus, who argues that when we enter cyberspace and leave behind our embodied selves, we lose our sense of connection to reality. Virtual environments engender no sense of physical and psychological vulnerability: we cannot get hurt when watching a movie or when we drive a virtual automobile, nor are we subject to the scrutiny of others.¹ Consequently, virtual environments deprive us from the engagement and commitment that are engendered by our corporeal embodiment in the physical world, and along with them—from the ability to distinguish the relevant from the irrelevant, what is real and what is not. Because engagement and commitment are necessary to make sense of things, disembodiment and de-contextualization hampers our ability to learn.

It is tempting to think that we can create Cyber-places—ones that exhibit a sense of place—simply by developing virtual environments that resemble physical ones, or even abstract ones. But such environments address only the physical (object) part of the place concept. To qualify as a ‘place,’ these environments must also engender contextualization and embodiment.

¹ Witness the phenomenal success of pornographic web sites.

Dreyfus conjectures that telepresence can substitute for physical embodiment if it enables human beings to be present at a distance in a way that captures all that is essential about bodily presence. Such presence would have to be perceived by both the actor and those whose presence s/he informs as an involved, embodied being. This means an ability to sense and control events in the world, and get perceptual feedback concerning what has happened. Such feedback must be instantaneous, not delayed, otherwise the mediation of the equipment will render the experience false. Moreover, such telepresence should include serendipity and vulnerability: the feeling that unexpected events may occur, and that they may affect us in good or bad ways.

Such presence is more than a matter of mere perception: it is based on our innate bodily experience which strives to determinate otherwise indeterminate phenomena, so we can get an optimal grip on the world around us. Hence, a sense of presence requires not only perception and action, but also contextualization: the ability of the environment to represent 'somewhere,' as opposed to 'anywhere'; to represent (appropriate) social/cultural cues; and to respond autonomously to events outside our control. Such autonomy cannot be encapsulated in automatic 'bots,' which are typical of video games: it requires intercorporeality—the presence of others, whose own contextualized experience cannot be predicted.

Together, contextuality, embodiment, and physicality help create the social and cultural sense of the place. This sense, in turn, helps determine what matters and what does not. In a classroom setting, for example, it determines what is experienced as exciting or boring, salient or marginal, relevant or irrelevant. Students sense the 'mood' of fellow learners' reaction to the teacher, and thus contribute to the creation of a feedback loop to the teacher's actions. The teacher, in turn, senses when an example does not work. Vulnerability is engendered by a student risk being called upon to demonstrate his/her knowledge, and the teacher being asked a question s/he cannot answer.

Mediation

Presences in a virtual environment is, by necessity, mediated: it is communicated through the medium of a book, a film, and more recently—the computer. To be successful, the media must be transparent: it must interfere with the experience as little as possible, and faithfully convey the perceptual and social experiences as we would expect it to be had we been physical present in the virtual world. Such transparency is a product of the medium itself, as well the cognitive state of mind of the observer: his/her

willing suspension of disbelief—the ability to cognitively override the sense of physical non-corporeality.

Authors and filmmakers have attempted to increase the transparency of the medium, and aid the process of suspending disbelief, through increased realism, detail, and richness of the experience. Video game developers and VR researchers have added to that *interactivity*—the ability to manipulate the simulated world, typically through the agency of an avatar. The avatar is our own proxy in the simulated world. Through it we can explore the world, manipulate it, and ‘feel’ the effect of others (our avatar may kill other avatars or die in simulated combat). Together, these means comprise the three determinants of presence: (1) the richness of sensory information communicated by the medium; (2) the level of control one has over the simulated environment; and (3) the degree of engagement one feels being part of the simulated world, rather than a passive observer of it. For example, the ability of the user to move his/her avatar, and the reaction of other users’ avatars to such motion, provide a heightened sense of presence compared to VRML-like experience, where the actor only has some control over the view parameters (IJsselsteijn et al 2000, Sadowski & Stanney 2002).

VIP

Distance learning technologies that separate the students from each other and from the teacher are bound to be less effective than those that create such a feedback loop of teacher/students action/reaction. As a result, on-line learning—compared to the traditional ways of learning—is limited and inadequate. Yet, it can also provide some opportunities that physical learning environments lack. In particular, it can provide contextualization to course content that is remote or abstract, hence make the learning experience more concrete and ‘real.’

We have been developing such virtual learning places for the past three years. We chose deliberately to develop learning environments that do not replicate or compete with physical ones. Therefore, we developed a learning environment that supports a course in anthropology, and one that supports a course in statistics. The first allows students to experience an ancient village, one that can no longer be visited in reality. The second attempts to put students in a setting that is related to the abstract subject of statistics—something physical classrooms have not been able to do.

To endow these environments with the qualities of contextualization and embodiment, we have developed *VIP* (Virtual Inhabitation and Presence)—software that allows users to ‘enter’ and ‘inhabit’ the environments, and to interact with each other. *VIP* is a multi-user domain, comprising a number of inter-connected modules. At its core is a 3D viewer, where actors can see the

environment they inhabit as well as one another, in the form of avatars. Each actor can manipulate his/her own avatar, and certain objects in the environment. These actions, which include walking, sitting, pointing-at, picking-up and moving objects, are communicated in real-time by *VIP* to all other actors who are present in the same environment at the same time. Hence, each actor can see the location and actions of all other actors, and the results of their actions.

VIP's communication modules provide actors with the means to identify individual actors and to control social settings, in addition to talking, chatting, and using collaboration tools like white boards and web browsers. For example, an actor can address another specific actor, or a group of actors, or everyone who is logged in to the same environment. These last two social settings facilitate group work and lecture modes, respectively, which allows the teacher to experiment with novel teaching modalities, such as just-in-time learning: switching between a 10 minute lecture and a related group problem-solving activity, then back to another 10 minute lecture, and so on.

Conclusion

The core idea presented here is that in order for us to harness the web as a place for human activities that is equal to—perhaps even better in some cases—to physical places, we must go beyond capturing the physical features of the environment: we must also to capture its social/cultural aspects, and to afford embodiment. Only then can we develop virtual places that are inhabit-able, not merely visit-able. In such environments we will interact with one another, not only with information. We will become part-of, rather than a consumer of the information, and convey to each other rich social and cultural experiences, derived from contextualized, place-specific inhabitation and presence. This contextualization will, in turn, help us and others interpret the content of our communication, and infer from it meaning, not merely information. Thus, although we use technologies that are similar to web pages (i.e., 2D screens rather immersive VR), the message conveyed by the context and content of the display can engender a sense of place.

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