



## Where is this place?

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### Abstract

'Place' is arguably an essential component of most successful virtual environments, yet the concept of what is 'place', and what sort of 'placeness' is required for digital environments, are seldom discussed. A reflexive argument such as *here is a place because it was designed to be a place* does not stimulate design guidelines for virtual places, and it certainly does not help us create and evaluate virtual places suitable for audiences who vary in intention or in available technology. To articulate useful distinctions between virtual places, this paper extends design guidelines proposed by Kalay and Marx, reshapes them with the help of Relph's definitions, into spatial visualisation and activity-based environments, and adds a further category, the hermeneutic. The paper also proposes a graduated matrix for selection of placemaking elements and for selecting a mode of representation appropriate to the design objective of the virtual environment, be it spatial, activity-based, or hermeneutic.

### Introduction

A dictum that argues "A place is a place" does not immediately help us determine whether specific virtual environments have or require a sense of place. Instead of grappling with a potentially circular argument such as *here is a place because it was designed to be a place*, we should ask what possible features a sense of place has, and in which situations those features vary. Only then should we ask which features of place for which particular audience can be approached via digital media. The paper extends the criteria for cyber-placemaking proposed by Kalay and Marx (2001) and the categories of virtual environments proposed by Relph (1986). Additionally, we introduce a further category, the hermeneutic. We use these ideas to develop a graduated matrix for selection of placemaking elements and modes of representation appropriate to the design objective of the virtual environment, be it spatial, activity-based, or hermeneutic.

The paper is organized as follows. Section 2 reviews how place-centric ideas gained increasing currency in the context of digital environments and highlights problematic aspects with regard to placemaking. Section 3 reviews disciplines such as architecture, literature, film and cultural geography to identify ideas relevant to placemaking in virtual environments. Section 4 reviews and extends the placemaking criteria proposed by Kalay. Section 5 introduces a graduated matrix for correlating types of virtual environments, features of place, and technologies. Section 6 outlines a research project underway and its design elements, followed by a conclusion in the last section.

### 1 Appropriation of 'Place'

Various accounts of the so-called cyberspace, virtual environments, etc. trace development of computationally vivid sensory representations and experiences to the mid 1960's, (Benedikt 1991; Woolley 1992; Wertheim 1999; Anders 1999). The most notable was Sutherland's vision of "... a looking glass into a mathematical wonderland" (Sutherland 1965). Despite those pioneering ideas, most human-computer interaction literature, at least until the late 1980's, revolved around understanding *task-artifact coupling* and it is hard to find an explicit reference or a discussion of 'place' in that literature.

By the early 1990s, however, place-centric concepts in the context of digital environments rapidly gained currency in both computing and popular literature. The appropriation of 'place' into digital realms was facilitated by two major developments.

First, the wide spread connectivity of networks, and development of transparent communication interfaces led to a pervasive rise of the Internet. Second, various developments in computing hardware and software made possible real-time interaction with multimedia data.

The cumulative result of these developments, in turn, led to visual computing paradigms, real-time graphics, multimedia processing, and equally significantly, to distributed computing paradigms. Although electricity, telegraph, radio, and other technologies have spatial dimensions (in terms of coverage, intensity, connectivity, etc.); it is only in the context of interactive digital technologies in the early 1990's that we come across placemaking as a structuring idea.

During the last twenty years, a number of virtual environment projects were pursued, each attempt adding one or more layers of inquiry and complexity. For example,

- The early surround video-projection based city simulations
- VIDEOPLACE project (Krueger 1985)
- Historical reconstruction environments, e.g. The Foundation of Hellenic World (<http://www.ime.gr/fhw/en/projects/3dvr/index.html/>) contains reconstructions of the Greek cities and monuments, The NuME project (<http://www.cineca.it/nume/>) illustrates evolution of the city of Bologna.
- Multi-user domains (MUDs) comprising both text and graphical elements, e.g. Active Worlds (<http://www.activeworlds.com/community/maps.asp>)
- Role-playing environments: The Renaissance Project (<http://www.renaissance-project.com/>) offers reconstruction of prototypical renaissance court and an opportunity to learn social and cultural aspects by adopting various roles

The above projects (and many other similar ones) increasingly employ three (and more) dimensions for structuring information and interaction, supplemented with a wide array of multimedia data that may be pooled together as needed from disparate sources. Additionally, information represented in such projects is becoming ever increasingly hybrid, reflecting both real and imaginary dimensions. However, any discussion of place in such projects eludes easy characterization due to the following major problems.

### 1.1 Concepts and Terminology

There is a lack of clearly defined concepts that help designers understand appropriate placemaking in virtual environments. How to select appropriate place making features is not helped by the slippery (and circular) nature of language in virtual environments literature and discussion.

Additionally, until recently, many designers considered the degree of visual correspondence between real and virtual worlds as a sufficient measure of successful virtual environments. For example, Kalay and Marx (2001) use such a scale to classify 'cyber' environments into: *hyper reality*; *abstracted reality*; *hybrid cyberspace*; *hyper virtuality*.

However, terminology based solely on appearances or delivery does not explain the aims of designers, the goals of users, or the interactive content that arises out of virtual interaction and interpretation between users in their attempts to solve tasks. Indeed, apart from the magnetic attraction of ever expanding vocabularies, such terms do not even help us understand why we would want to be in those virtual environments in the first place.

So despite the appropriation of place-centric rhetoric to virtual environment development, a number of issues remain unaddressed. This leads us to doubt that there is any *there there* (even if a large number of users appear to be somehow interacting with the contents of these projects, as claimed by Kalay and Marx 2001). At best, the current virtual environments provide only a degree of visual realism, and fail to incorporate a richer conceptual and behavioral framework that acts as more than a backdrop. For example,

- Active Worlds allows one to build houses and thus might seem to have some kind of place-ness. Yet there are no dynamic environmental or physiological features that would constrain

and thus uniquely identify places. Some users now talk of vandal police (as users can set fire to other houses) but apart from that interesting social development, one is confronted with an absence of tasks, limited social interaction and movement, and an absence of any historical context.

- The Renaissance Project does not have an exterior, agents walk around a predefined place, and one cannot modify the environment. However, agents do remember user profiles, and one is given tasks to complete in line with a Renaissance book of manners, in order to become rich or famous etc. Still, as the place itself does not retain *footprints* of users, it does not seem to have a great deal of place-ness, especially as the agents could exist in any of the rooms.
- According to Mosaker who reviewed Miletus and Bologna reconstruction projects (Mosaker, 2000), *it is all architecture, no life forms*. For stage sets, however perfect, do not tell us much about how people lived there. These historical reproductions reduce authenticity to the visual surface.

The above examples, on the one hand, demonstrate that place-making notions are becoming crucial in such projects, e.g., territorial demarcation in Active Worlds, scripted encounters through role-playing in the Renaissance Project, or reconstructions of past moments in time. On the other hand, it is not clear if interaction with and experience of 'place' in Active Worlds is somehow identical or similar to that in the Renaissance Project. Neither is it clear how they are dissimilar (apart from in appearance or delivery) that might allow us to distinguish one place (if there is any) from another.

Why is there no there *there*?

### 1.2 *Photo-realism is not essential*

The recent developments of highly accurate and large-scale virtual heritage scanning technology indicate that the impedance to capturing a sense of place in digital models is not a problem with capturing realism. Virtual environments exist with photo-realistic laser-scanned artifacts, augmented by textures scanned in from real-world materials. However the reason why such environments lack a sense of engagement and therefore lack a sense of place is too often because they lack thematic interactivity, the interactivity that has helped make computer games so popular (Eiteljorg 1998, Laurel et al 1994, Mosaker 2000). While visual correspondence to reality may be a great help for visualising layout and orientation of a site, our knowledge of a place is deepened by our activities as shaped by that place, and our identification with or against that place.

If a feeling of presence depends on a feeling of active participation in a place we argue that a hyper-realistic spatial setting by itself does not necessarily create presence. The philosopher Immanuel Kant suggested that an over abundance of sensory data either too large to imagine or so large it overpowered the senses, was an aspect of the sublime. Popular cyber-literature often uses this idea to conjure up infinite spaces of overwhelmingly precise detail. But to suggest presence is attained solely by an over abundance of realistic objects (Kant's mathematical sublime) or by overpowering physical phenomena (such as in floods, and giant waterfalls, the natural sublime) alone, is to create an environment incapable of cultural inscription.

### 1.3 *Lack of Cultural Presence*

Typically the role of place in virtual environments has been as a locator of objects. Yet cultural geographers argue place is more a constrained and malleable container of localised activities, evoking associations of past events and stimulating future tasks.

In fact, virtual environments are often criticized for evoking 'cyberspace' rather than a culturally shared notion of 'place'. In other words they lack the richness of associations and encounters of human transactions in real space (Benedikt 1991; Johnson 1997; Heim 1998; Coyne 1999).

Without content relating directly to how we perceive the world, an emphasis on formal realism is not creating a virtual reality, but a storehouse of visually represented objects. A possible reason why early environment builders aimed for realism rather than for content may have been a belief that we

experience reality as something objective, settled and constant. Solid and immutable objects may be easier to conceptualize and model than what reality is really made up of. However, our notions of reality are actually cultural notions of a constructed reality (Riegler 2001).

Digital simulation of objects by itself will not enable meaningful content that contextually places a virtual environment in an engaging way. If the purpose of virtual heritage models is to preserve the culturally significant articles of the past, they must demonstrate reasons for simulating that past material culture. Yet they are generally used as showcases for technology rather than to reveal the views and beliefs of the owners of that culture.

In most current digital environments, objects are not digitally simulated as objects-in use, with life histories, with formal or associational traces. They are simply three-dimensional objects. Even if the models did bear formal traces of a life history, of a series of interactivities (interactive activities), they lack fail to effectively communicate correlate knowledge required to infer why that particular artifact was contextually meaningful.

This may be due to the difficulty of conveying the worth of objects from a different cultural background, and conveying its cultural significance, its imagined presence. Yet an idea of cultural presence must mean that people with a similar or different cultural perspective to ours, can occupy a place, and be so identified as like or unlike, by us and therefore allow us to be present 'in a place that has some present meaning' (Slater 1999).

## **2 Other 'Places' and Place-making**

Other fields of human endeavour, such as architecture, literature and film, reveal that place is often imaginatively reconstructed through suggestion, rather than through realistic attention to detail alone.

### *2.1 Architecture*

In the creation of architecture, place is often highly referential. For example, skewing fenestration in relation to paths creates glints of far off vistas. Thematic separation of internal volumes into a tapestry of paths and centres that emphasise discrete building functions, can also suggest another realm.

In the writings of Nietzsche and Spengler and, from ancient monuments to buildings of the 'Heroic Modern' era, architectural environments appear to confront gravity and time. Thus architecture is not just a collection of physical objects, but they are also metaphorical, allegoric, and thematic, reliant for effect on the interactions between the building, dynamic external environment, and people and their beliefs and values. Norberg-Schulz defines place as "a dynamic unity of architectural elements, inhabitants and interactions between/among them." (Norberg-Schulz 2000). Alexander (1977) similarly captured the essence of interactions between humans and the environment in patterns and how they evolve into distinct places. Patterns are also used by archaeologists to decipher past worlds of meaning. So architecture has cultural as well as formal properties, it codifies and helps codify culturally shared responses to possible situations.

### *2.2 Literature*

As with architecture, literature suggests life-worlds through the use of patterns and motifs. Unlike architecture, the power of literature to signify place rests on continual and sustained evocation enlivened by dramatic tension or by descriptive power through a fixed story line. It conjures up an emotively charged setting, it is an imaginatively reconstructive projection and suggests place via atmosphere that is an integral part of character intentions and tasks.

Constructed through textual representations and linear format, the best of literature retrieves time, space and experiences, to move a reader from being a mere spectator to a participant, by appealing to a reader's personal experiences and associations. By suggesting rather than completely describing, the book only circumscribes reality by adding in our real-time imaginings of a place. Hence in reading a book, we are really experiencing an imaginative construction of a world based on the interaction of our

personal experiences and our inferences of what is happening, and, (sometimes), the authorial intention. Realistic description is only part of the act of reading.

### 2.3 *Film*

Via transitions and fades, film is intentionally unrealistic (Laurel et al 1994). Cinematic and linear representations craft places from a single perspective. "As Hugo Håring noted in 1924, "Space in film only needs to be unique, singular, designed for one event only, one instance of joyful bliss, one moment of horror." (Neumann, 1996) Compared to literature, films offer a multisensory narrative albeit within a similar linear format while challenging that constraint through various mechanisms such as transitions, fades, split-screens, etc. Further, films suggest off-camera space but never show you it; by using fragmented perspectives they coerce the viewer into believing they are both happening now, and happening in a world that encloses the viewer.

### 2.4 *Cultural Geography*

For cultural geographers, culture has a setting and this setting is enabled through a perceived sense of place. As culture requires a setting, it must be "embedded in real-life situations, in temporally and spatially specific ways" (Crang 1988). While unique, place is further an "integration of elements of nature and culture...linked to other places by circulation" (Lukermann cited in Relph 1986).

The interactions between these objects and their setting may be quite complex (Cantor 1976). Culture is a feedback loop. A visitor perceives space as place, and inhabits (modifies a place), place "perpetuates culture" and thus influences the inhabitants in turn.

We might say that social behavior is behavior between two or more people. Cultural behavior is a subset of social behavior, where behavior is governed by or understood in terms of a cultural setting. And as culture almost inevitably involves transactions, there must be objects of shared transactional value.

Thus, the old communication model of culture requiring only a sender and receiver of data is inadequate; culture is a highly interactive dialogue of human ideas transmitted via social and individually constructed places. In order to create culturally evocative environments, we need to understand which interactive elements disseminate cultural information. According to Schiffer and Miller (1999), we learn about a culture through dynamically participating in the interactions between

- Cultural setting (a place that indicates certain types of social behavior)
- Artifacts (and how they are used)
- And people teaching others a social background and how to behave *along with* one's personal motives.

The only way then to approach this issue is to view (and design) environments depicting human cultures as *hermeneutic* (that afford an actively engaged interpretation of the lives and intentions of past inhabitants). The hermeneutic features of place in these environments are almost certainly more difficult to create digitally, but that does not negate their importance. Luckily for virtual environment designers, these hermeneutic features have been described by social scientists who maintain that people develop shared cultural perspectives of place through many different ways.

- If place as location is a nexus of environmental forces or attributes, we can learn about place in relation to culture by human behavior and perhaps even infer specific mental attitudes by the ways in which humans respond to these environmental forces.
- We can also tell cultural behaviors by inference from the properties of related artifacts (for example, properties in Japan near burial grounds are significantly cheaper than other housing areas).

- We can learn about the significance of a place by social learning (by people telling you or instructing you).
- We can learn about a place through task-based activity there (for example, we learn a swimming pool is suitable for swimming).
- We can learn about the significance of a place by how old or worn it appears. These cues can tell us if it is popular, venerable or abandoned.

### 3 Place in CyberPlace

Which key ideas can we adopt from architecture, literature, film and other disciplines to extend and further articulate the place of *place* in virtual environments?

Kalay and Marx proposed eight criteria for “Cyber-Placemaking” (Kalay and Marx, 2001) borrowed from architecture and town planning. These include: place as settings for events, that are engaging, provide relative location (i.e. orientation), provide authenticity, are adaptable, afford a variety of experiences, afford choice and control over transitions, and are inherently memorable.

Granted, it is hard to argue with the appropriateness of the above attributes, for many writers have used similar criteria. Coyne talked of association, authenticity, activity and task-based criteria (Coyne, 1999), Relph defined many different types of place and how each offered a mix of experiences, (Relph 1986). Laurel spoke of the need for engagement and personalization (Laurel, 1990). Armed with a literary background, and inspired by both the Memex and the Memory Palaces of Simonides, Johnson argued (1997) that the most engaging three-dimensional environment would be socially associative, interactive, and task-oriented with a ‘recall’ or a ‘trail’ of the users.

Although the criteria proposed by Kalay and Marx (2001) are useful, they do not help us to determine which of the above features are most important, necessary, or even desired, for different types of virtual environments. Further, they do not address several important features of place.

For instance, places are not just memorable but also evocative. Hartshorne said geography is a need to “fix the memory of the places which surround us”, (Relph 1986). Geography indirectly highlights our schemas of place- be they telluric, projected landforms, or urban. When triggering mental associations to these schemas, place is evocative, evoking remembered sensations of its previous self, of related activities or even of similar places.

Place gains unique character through time and use. Place is not just adaptable, but also mark-able, recordable, it leaves signs of its use; it erodes or denudes into more or less usability (see Massey 1993). In this sense one can argue that place is an artifact, as past events can often be inferred from it. Through graffiti, vandalism, and human induced erosion, it is also personalised. Yet where in virtual environments do we see people leaving marks?

Place implies a certain type of setting, of occasion. A designer is required to invent cities, individual buildings, and spaces, and to provide them with a history, with patterns and traces of use, in order to connect them to the underlying narrative and to endow them with meaning. “The set must present the character before he appears, must indicate his social position, his tastes, his habits, his lifestyle, his personality”, wrote Robert Mallet-Stevens in 1929, (Neumann 1996).

Place is also defined by its relation to other places, we often populate place with artifacts from other places. Hence some of its uniqueness is ironically as a locus of features from travels through other places (Massey 1993).

To approximate reality requires settings for social transactions that are location specific and task specific. There is also a need for transition zones of perceived physiological comfort and discomfort. These features are often associated with thematic symbolism in architecture (Champion 1993).

Architecture modifies behavior through symbolic cues, offers paths and centres so that we can navigate and orient ourselves, and suggests the passage of time as well as records the meetings of people.

Architecture is also a filter of human-environment interaction, yet is not fully utilised in virtual environments as both affordance and as constraint. As Coyne (1999) argues the third major way of creating virtual space is where “cyberspace enables and constrains human interaction in ways similar to physical space.” A feeling of place is dynamically impacted by environmental constraints. We place or site and center ourselves optimally inside a flux of forces that affect our task efficiency (e.g. path of least resistance), our social standing, and our feelings of comfort.

Place is also artefactually defined. We place artifacts in relation to our perception of how we appreciate or dislike environmental features. A bed may be close to the window but turned away from intense morning light. So our idea of place is identifiable as a locus between environmental features and personal or physical preferences. And also ‘placed’ (spatial) artifacts can indicate social relations between people and between artifacts, such as houses close to or far from each other (Schiffer and Miller 1999).

Yet artifacts are not just social, they are also cultural; they have a past meaning that informs a current use. The artifacts act like a library of memory cues to remind people how to behave according to certain events or locations, (Johnson 1997, Crang 1998, Relph 1986). Not just objects but also the wider environment can act as an artifact. Place is also a collection of symbolic cues for inhabitation, and for territorial possession, (Rapoport 1982).

As Relph noted (1986): “The identity of a place is comprised of three interrelated components, each irreducible to the other, physical features or appearance, observable activities and functions, and meanings or symbols.” So the place-making criteria of Kalay and Marx address only two major types of environments addressed by Relph, environments that afford ‘physical features or appearances’, and those that afford ‘activities’. The Kalay-Marx criteria, being based on modes of reality, do not address virtual environments that attempt to offer interpretations of past and present cultures.

Partly this omission is due to the fact that it is difficult to simulate culture, virtually or otherwise. As Yi-Fuan Tuan notes (1998), “Seeing what is *not* there [our italics] lies at the foundation of all human culture”, yet virtual environments by convention attempt to simulate what *is* there.

#### 4 Dimensions of Virtual Environments

Instead of using the degree of visual correspondence between real and virtual worlds to discuss *place*, we propose a matrix (Table 1) that correlates multiple dimensions of virtual environments in terms of purposes they serve, features they require, and experiential potential they offer.

Such a graduated categorization, on the one hand, allows us to correlate place-making features to general aims of virtual environments (spatial visualisation, entertainment, social and participatory through to culturally immersive experience). On the other hand, it also suggests that a hermeneutic virtual environment (one that has to be actively interpreted by a participant), is the most difficult to engender.

According to the preceding matrix, the simplest stage of visualisation is capturing and manipulating and visualising three-dimensional objects, a more advanced stage is the ability to navigate through landscapes. Technology now allows us to adequately capture realistic detail, and to accurately mimic physical laws, so this type of digital environment, while achievable and useful for various scientific purposes, only represents spatial configurations and navigation through them.

The second type of virtual environment, the one that affords activity-based interaction, allows a more interactive form of wayfinding. Tasks can be formulated inside the environment through interaction, supplemented with decision making and navigation for a more immersed experience. Computer games and flight simulation perhaps best convey this type of digital environment.

**Table 1:** Graduation of Place and Cultural Functions

<i>Type of VE</i>	<i>Relph's categories</i>	<i>Features</i>	<i>Personal / Cultural Attachment</i>
Spatial Visualization	Existential outsidersness- (Objective)	Locational (links)	Locates setting
		Navigational (orients)	Locates paths and centres
Activity-based	Vicarious-behavioral-empathetic insidersness (Activity and Events)	Memorable (unique)	Has uniquely occurring events
		Territorial (protects)	Locates shelter; repose in regards to dynamic environment
		Modifiable	The artifacts and surrounds can be modified
Hermeneutic	Existential insidersness (Symbolic)	Culturally coded	Supports an idea of agency-directed symbols that reveal secrets of the environment
		Abandoned inhabitation	Evokes an idea of social agency and past inhabitation
		Lived-in inhabitation	Supports interpersonal social behavior through human and or computer agents
		Home	Affords personal shelter, primary orientation, identification, possession and collection of artifacts.

However, only if the environment evokes a notion of other people interacting with the environment in ways similar or dissimilar to us, does the digital world begin to form, (or, to quote Heidegger, “worlds world”). A hermeneutic environment requires the ability to personalise and communicate individual perceptions through artifacts, and the more deeply this cultural communication can be unselfconsciously expressed through our modification of our surrounds, the more this environment becomes a dwelling, a home, a *place*. The degree of complexity of such a virtual environment may range from merely believing people with a different world-viewpoint existed in an environment, to feeling that we are being rejected or assimilated by another culture, to feeling that we are “home”.

At the moment, we know of no virtual environment that can compare in emotional attachment to a real world home, and hence we argue that this is the most difficult type of virtual environment to create. However, we can test for “mild” hermeneutic immersion in a virtual world, where a participant begins to use and develop the codes of other cultures in order to orient and solve tasks, and to communicate the value and significance of those tasks and goals to others.

The distinction between the three types of environments is determined by the degree to which the virtual environment can afford new social tasks and new perspectives, which in turn dictates the level and complexity of interactivity and interface needed. The particular type of virtual environment that might be required thus depends on the amount and intensity of cultural perspective that needs to be generated and conveyed.

Based on the preceding categorization, we now suggest possible combinations of digital compositions and technologies that respond to different design aims through specific placemaking features.

#### 4.1 Matching virtual environments and technologies

In order to choose an appropriate technology, we need to determine the extent of place making features necessary to convey the required information, be it for visualisation, activity-based, or for hermeneutic understanding. As virtual environments typically involve spatial representations, it would help to consider the overall form. Is it to be a self-contained object, an object in the landscape (similar to theatre in the round), as a frame filtering you from the external view (as in a panorama), or as a complete world?

Architecture as a self-contained externally realised object can be embedded directly in a webpage and can allow for annotation (audio or visual) via markup technologies tied to an external database. Objects in landscape offer the opportunity to also bury markers (annotations) in culturally coded ways supported with spatial and temporal databases. They can be made more powerful with realistic recreations of weather patterns as well (supported in programs such as Blueberry3D, Black and White).

The frame and panorama idea allows hyperlinked objects, the tracking of x y z co-ordinates, the selection and hence annotation of 3d objects etc. This technology could be used for visualisation of plazas, open spaces and interior spaces (but not so convincingly together).

However, for the inside-outside evocation of architectural form game engines are more powerful. Breaking down the environment into cells, game engines support real-time interaction, particle physics, fully interactive artifacts, dynamic physical environments, multi-user participation and chat logs, annotation and personalisation (if often via gun scorched walls and corpses!) and simulated weather conditions, as well as terrain modeling (see for example game engines such as Unreal, Quake, MaxPayne, Torque, Black and White).

### *4.2 Interpretive perspectives require engaging interaction*

For creating a virtual environment with a notion of a 'place' (a region recognisable to a user as a culturally coded setting) we need to have more than merely identifiable or evocative virtual environments. A virtual environment must allow us to see as much as possible through the eyes of the original inhabitants. It must also suggest ideas of thematically related events, evidence of social autonomy, notions of territorial possession and shelter, and focal points of artefactual possession. In other words, the virtual environment must provide a perspective of a past culture to a user in a manner similar to that deduced by trained archaeologists and anthropologists from material remains (fossils, pottery shards, ruins, etc).

In order to be motivated to view other perspectives, we could learn much from game design. Games have been promoted as being as the most engaging of all virtual environments (Laird and Van Lent 2000, Laird 2001). Bryce and Rutter (2001) "...estimated that almost three-quarters of people under thirty have played a computer game, ...". In games, abstraction can be just as engaging to users as a sense of realism. Further, as users become engaged in the tasks, it is easier to observe them without damaging their level of engagement, especially as games traditionally have built-in evaluation mechanisms.

Once designers have provided goals for participants in virtual environments, they will need to create interactive elements to enable and encourage participants to reach those goals. We suggest that there are fundamentally three such interactive elements, social agency, modifiable artifacts, and dynamic environments.

There is a growing support for the view that physical space and engagements need to address perceptions of appropriate or believable social behaviors (Schuemie et al. 2001). If social behavior is an important way of transmitting cultural information in relation to artifacts (and externs), then we require some form of seemingly autonomous social agents, be they computer based or other participants.

Designers of real and virtual environments also need to build on relationship between patterns of inhabitation and usage of spatial artifacts, such as furnishings, (Rapoport 1982; Beckmann 1998). Even if the word 'culture' is a noun and not a verb, cultures are processes not products. Cultures can only exist socially through artifacts, labeled by Sauer as "agents of change" (Crang 1998). However, artifacts alone constitute only a fragment of the cultural process. To fully understand a cultural environment, one requires both artifacts, and an idea of the task that motivates using them.

Some of the most effective constraints in both physical and virtual realms that offer and often dictate behavioral cues are derived from the dynamic nature of real-world environments. Modeling such dynamic environments can range from shelter and familiar territory, to a hostile world depending on task direction, artifacts carried and their impacts on users' abilities.

Such environments can be permanently modified by user interactions. Some parts of the environment may impede the progress of the user in order for the user to recognise trails and paths, and socially accepted ways of traveling through the environment. The other parts of the environment may be deleterious to the avatar's metaphorical health- in other words, they act as constraints. The dangers and

opportunities of the environment could be contextually related to the local cultural perspective.

## 5 Digital Interactions and 'Place'

In order to explore a subset of issues raised in the preceding discussion, a research project is underway. Its goal is to test a hypothesis that digital environments that are *recordable, evocative, referential and hybrid* will lead to a more engaging sense of 'place'.

In this research project, users will travel to the reconstruction of a historic site. Their goal will be to find local artifacts that act as time portals, to complete tasks to gain other artifacts, and trade others in order to aid spatial (and cultural) navigation and increase knowledge of the cultural setting. From advice given to them by computer-scripted agents, users will navigate perilous paths to improve the clarity and detail of their maps. They can record on memento maps significant events and encounters.

The following elements of the experimental environment are under development:

- Attenuating environmental forces (for example, wind, fog, rain, directional and dynamic lighting, sound, varying vision acuity), traces of the activity of interactors and of the passing of time
- The ability to be affected (modified including modification by attenuating environmental forces).
- Specific details (topography, textures).
- A way of triggering past associated environments or events that the virtual environment thinks a visitor has been to.
- Tasks, events, artifacts and complex interactors (agents) that are specifically place-associated (for example, actors at certain times may be able to move certain artifacts, but they will only be able to place or leave them in specific places).

## 6 Conclusion

The paper argues that a sense of presence in virtual environments and real experiences is not just a consequence of being surrounded by a spatial setting but of being engaged in another place. A place is particular, unique, dynamic, and memorably related to other places, peoples, and events, *and* it is hermeneutic. The paper argues for and proposes a more graduated approach for understanding features of different kinds of virtual places, and the cultural and social functions they facilitate in order to guide selection of appropriate design elements and technologies.

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