Presence and the Aura of Meaningful Places

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Abstract

We propose the term aura *to enrich the current language for designing and analyzing media experiences, especially when using augmented reality, mixed reality and ubiquitous computing technology. Aura describes the cultural and personal significance that a place (or object) holds for an individual. An MR application can exploit aura to make the user's experience more compelling or educationally rewarding. Aura provides a necessary complement to the concepts of* presence*, which is commonly used to evaluate VR applications, and of* place*, which refers to the more generic significance of places, particularly in CSCW applications. We use the Oakland Cemetery in Atlanta, Georgia to illustrate the concept of aura. A number of research questions about the relationship of aura, presence, and place are suggested.*

Keywords--- **Augmented Reality, Mixed Reality, Presence, Aura, Cultural Heritage**

1. Introduction

For more than a decade, since the publication of the first number of the journal *Presence*, presence has been a key concept for understanding and evaluating the effectiveness of virtual environments. VE researchers have used the term to describe the mental state of the user in response to being immersed in a virtual application [24][31]. They have offered a variety of definitions and proposed a variety of measures for presence, and presence remains a powerful conceptual tool for many applications. During that same period, however, two related developments have occurred in computing that call for a broader application of presence, while testing the limits of the current definitions and concepts used in presence research.

The first development is that the research community and the computing industry have shown increasing interest in devices and applications that integrate virtual information into the user's physical working or leisure environment. For example, ubiquitous computing researchers have focused on pushing computation into the world where it blends in with other available tools [30],

designers of tangible media emphasize the importance of physical manipulation [11], and augmented reality (AR) systems tightly couple synthetic media with the physical world to create perceptually-integrated physical/virtual worlds [7]. For simplicity in this paper we will refer to all such systems that combine physical and virtual worlds as *mixed reality* (MR). MR techniques have now been explored in a wide variety of domains, including battlefield visualization, maintenance and repair, air traffic control, urban design, office work, games, and medicine.

It is not clear that presence per se is useful for evaluating MR applications, at least not as it is commonly defined by VR researchers. If presence is defined as a sense of being in a physical place, then one might be tempted to say that MR applications get presence "for free," since the subject can see and interact directly with the physical world. (As we will discuss later in this paper, the mediated nature of MR applications makes the situation more complicated, especially when one considers the more general definitions of presence that focus on mediation rather than sense of place[1].) Researchers in MR applications have in general avoided using presence, preferring a variety of other approaches and concepts, including the concept of place [6], which we will discuss below.

The second development is the rise of a new class of applications, which use MR, VR, or even desktop multimedia to present culturally significant experiences. Researchers in Europe and North America are deploying digital technology to enhance the user's experience of cultural heritage objects, such as paintings and historic artifacts, as well as such sites as museums, castles, historic homes, and battlefields [1][3][10][22][27][29]. There are also entertainment applications in which computer-controlled digital information is displayed in situ in the physical world. (In a sense, much of Disney World and other theme parks are really mixed reality experiences.) Again the concept of presence alone does not seem adequate to describe these applications. Marsh shows that media theory (the work on earlier media forms, such as film and drama, as well as the work of contemporary digital theorists) can be used to expand on the concept of presence for these applications [16]. Marsh argues, and we agree,

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[1] The International Society for Presence Research defines presence in relation to mediation. See http://www.ispr.info

that new media experience designers can draw on the techniques of filmmakers (and other media) to engage the emotions of the user. This emotional response of a person to a significant place or object is often powerful and can be leveraged by media experiences.

Many designers who create experiences in historic sites are already explicitly trying to leverage this psychological response. However, without a common framework and terminology for these aspects of places and objects, it is difficult to discuss the principles on which the media experiences are based and thus learn from previous designs. Over the past four years, our own work has increasingly focused on *experiential* MR applications, such as tours of, and dramas set in, historic locations [14]. The appeal of these experiences (for both ourselves and other researchers) derives from the rich historical, cultural, or personal meaning that such places and objects have for the participants. If a place is emotionally engaging to begin with, an *in-situ* experience should be more engaging than a film, web site, or VR application that is experienced away from the site.

To describe and eventually to measure the user's sense of emotional engagement, we are proposing a concept that we call "aura." We believe that aura provides an important complement to presence and can enrich our understanding of users' responses to a variety of different computer-mediated experiences, especially in cultural heritage sites. In addition, aura can serve as a bridge to relate the VE research in presence with the research by the MR and CSCW communities on the concept of place.

In the rest of this paper, we define and elaborate on the concept of aura. As an example, we discuss MR experiences we are designing to exploit the aura of an historic site in Atlanta, Georgia. We also discuss the complex relationships between aura and the concepts of presence, place, and embodiment. Finally, we suggest ongoing research questions: in particular, how aura might be measured and correlated with presence.

2. Definition of aura

Consider the following question. Since almost anyone can afford to hang a reproduction of a painting like the Mona Lisa on their wall, why do millions bother to travel long distances to Paris to visit the Louvre in person and crowd around Da Vinci's painting? Clearly it is important to these visitors to be in the physical presence of the painting; there is "something" about being near the real thing. This something is the Mona Lisa's "aura", which is the sum of the painting's historical (e.g., it's age and who painted it), cultural (e.g., we place a high value on such art objects), personal (e.g., you may have visited the Mona Lisa during a long ago vacation with a cherished friend) contexts for a viewer. In this case, for many in Europe, North America, and elsewhere, both the Mona Lisa and the Louvre museum (as a place) have aura.

Media theorist Walter Benjamin introduced the concept of aura in the early 20th century to describe the effect on the viewer of traditional art objects [2]. Benjamin argued that new media technologies, specifically photography and film, led to new forms of art, in which uniqueness (or aura) no longer mattered. Benjamin's historical analysis is still influential among film and other humanistic theorists. We wish to adopt and adapt Benjamin's notion of aura; however, we do not agree that "reproductive technologies" (such as film in Benjamin's day or the computer now) always destroy aura. Nor do we agree that aura is an exclusively bourgeois value that popular art and entertainment necessarily want to reject[2]. We wish to apply the concept of aura to a wide variety of culturally significant objects and places and to consider how computer applications can be designed to augment or inform the user's experience of such objects and places. We offer the following definition of aura:

The aura of an object or place is the combination of its cultural and personal significance for a user or group of users.

The "cultural significance" refers to the shared meaning for a large community; the known history of the object or place plays a major role in the community's shared interpretation. "Personal significance" refers to the individual associations that the place or object may have for a particular user. An object or place can have elements of both sorts of aura.

Strictly speaking, all aura is personal, because "aura" describes the psychological response of one individual to the object or place. The personal nature of aura is fundamental to the concept: *aura can only exist if the individual can connect the object or place to his or her own understanding of the world.* Anyone can construct a trivial example to illustrate this point (e.g., an Inuit from northern Canada may have no knowledge of, and thus experience no aura for, the Mayan ruins of Tulum). The implication of this assertion is worth stating explicitly: *increasing the connection to a person's understanding of the world can increase the aura for that person.*

Although all aura is personal in this sense, we can also speak of the collective aura of a well-known cultural object, such as the Mona Lisa, because thousands or millions of individuals in our society have a similar response to the painting. Many such one-of-a-kind art objects and historic locations have aura. But even mass-produced objects may have aura: e.g. the store-bought birthday card that a friend gives you. The modernist artist, Marcel Duchamps, picked out common objects, his so-called "ready-mades" and designated them as art by placing them in a museum, giving them aura[3].

2.1 Aura as contextualized presence

Researchers in the BENOGO project, whose aim is to create the experience of "being there without going there", are attempting to understand (and leverage) aspects of

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[2] In a subsequent paper, we intend to discuss in more detail the question of aura in 20th century media, including new digital media.

[3] In a complicated way, Duchamps and other modernists such as the dadaists were playing with and calling into question the concept of aura, as Benjamin himself recognized.

unique physical locations to create more compelling VR experiences. They have suggested that research on presence in VR has been hampered by the fact that most VR applications offer their users a visual world that is generic. As they put it, if presence is the feeling of "being there," then we still have to ask: where is "there"? They argue that presence can best be achieved by placing the user in a meaningful context, and call this approach "contextualized presence" [27].

The BENOGO research in VR suggests to us another way to conceive of aura. Aura can be thought of as the difference between a place or object and a perfect reproduction of that place or object: for example, the difference between the physical world and the holodeck in the television and film series, *Star Trek*, or the difference between the Mona Lisa and a perfect copy. We understand this difference, however, not in any metaphysical sense, but rather in terms of user response. Assuming that the user knows or is told that she is in a VR replica of the Louvre and not in the physical Louvre, her experience will be influenced by that knowledge even if the sensory input is exactly the same as it would be in the physical location. Thus, even a perfect VR exhibit could lack aura and thus not be as compelling as an experience in the physical location. Similarly, if someone gave you a *perfect* copy of the Mona Lisa (and told you it was a copy), you would not react to it in the same way that you would to the real painting. This distinction highlights both the strengths and the potential limits of projects like BENOGO. By increasing a user's sense of place, the BENOGO researchers are showing how to create more compelling, more "auratic" VR experiences. It is not clear, however, that it will ever be possible to create virtual experiences that are "just like being there without going" as long as the user knows they are in a VR environment.

2.2 Other uses of the term "aura"

Some in the CSCW, VR and HCI communities have used the term "aura" in a different sense, typically to refer to some invisible property around an object. For example, in VR, aura has been used to indicate the extent of the physical interaction between two objects [8]. The Audio Aura system used the term "aura" to refer to the invisible information space through which the user moved, which was made manifest through audio [19]. However, the humanities have been using the term in Benjamin's sense for much longer, and we believe that Benjamin's sense of the term can also prove useful in explaining a range of digital (and other) media experiences.

2.3 An example of the aura of place: the Oakland Cemetery

The historic Oakland Cemetery in Atlanta, Georgia, USA will serve as our principal example of a location with aura. (See http://oaklandcemetery.com). Oakland was the major burial site for the city from 1850 to the early 1900s, when the grounds were more or less filled. Oakland physically embodies the history of the conflicts and achievements of the city. There is a section for Confederate soldiers, one for African-Americans, one for the Jewish population of the city, and one for paupers, whose wooden grave markers have disappeared. Famous southerners, major political figures (including 6 governors of Georgia and some 25 mayors), as well as economic leaders and the "inventor" of Coca Cola, are buried in Oakland [26]. Oakland is also a "garden cemetery", designed and used as a park, and is part of the Martin Luther King, Jr., National Historic District. For these reasons, Oakland possesses considerable aura for those who live in Atlanta and are familiar with this history.

Any cemetery has a certain cultural significance for anyone in North American or European society. For this population, a cemetery evokes some combination of apprehension and pensiveness because of associations about the dead, although this may not be true for all cultures. Any physical cemetery would produce some such response, even for people who know nothing about its particular history. This common cultural understanding of the meaning of cemeteries, as well as an understanding of acceptable behavior in a cemetery, is what defines what we might call, following Dourish and Harrison [9], the *placeness* of the cemetery for our culture.

In addition to this general cultural meaning, however, a particular cemetery may have special significance. The circumstances of Oakland Cemetery, along with its art and architecture, give it aura for those who know its history. Similarly, personal relationships with occupants of the cemetery (e.g., a relative or friend) would imbue a particular cemetery with personal aura. Aura can have a positive or negative valence. For example, an African-American visitor to Oakland might find the monuments to the Confederacy repugnant; the cemetery would still have aura for such a person. Oakland's aura can vary in intensity as well as valence: long-time residents of the city may cherish it, but some residents and many visitors may know little about it. Oakland's potential aura is great, because most visitors can find something meaningful in the range of historic figures buried there, its relationship to the history of the region, and its art and architecture.

Because of its value and location, Oakland receives about 40,000 visitors a year, ranging from tourists to city residents to children on school trips. There are a variety of traditional, human-guided tours for visitors, designed to focus on the interests of different audiences. For example, school children may receive a tour highlighting the historic figures they are studying in their civics classes, while tourist may receive a tour focusing on "colorful" inhabitants. Each of these tours has been designed assuming certain knowledge of (and thus aura for) the cemetery and have the (implicit) goal of increasing the aura of Oakland to enhance the visitor's experience and make the visit memorable.

3. Aura and media technologies

The design of the tours of Oakland cemetery suggests a larger issue: how can aura be evoked by various media technologies, especially MR technologies? In our
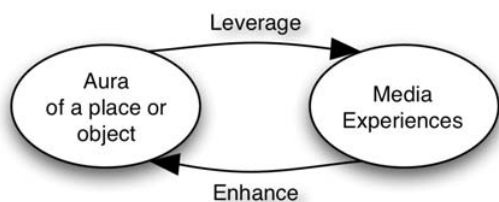
Figure 1. The relationship between aura and media.

discussion thus far, we have implied that by creating an experience in a place (or near an object) with aura, the experience itself will share in that aura. In this section, we address this idea explicitly.

Media technologies do not themselves possess aura in the mind of the user; the aura belongs to the object or place. The technology may evoke the aura a person already holds for an object or place and *leverage* that aura to improve the media experience. In addition, we suggest that a media technology can *enhance* the aura of an object or place by increasing the connection to the user's personal experiences and knowledge (see Figure 1). On the other hand, media technologies can also interfere with or diminish the experience of aura, which was Benjamin's original point about the technology of film [2]. For example, an inappropriately humorous use of ghosts in the Oakland experience could make it harder for the user to understand the contributions made by the historical figures or may cause negative reactions in visitors with personal relationships to occupants. It also seems that, by reducing aura, designers may allow people with overwhelming associations for a place to experience that place, similar to the way that VR exposure therapy can help people gradually overcome their fears (e.g., Virtual Vietnam [21]).

As Figure 1 indicates, the relationship between aura and the media experience is reciprocal. The designer leverages aura to improve the media experience, and the media experience can also enhance the aura of the object or place for the user. In fact, the aura of the place or object is often so tightly integrated into the media experience that it becomes difficult to distinguish between the processes of leveraging and enhancing.

Most people have experienced aura through a media experience, such as the sense of awe that might be conveyed by a documentary film on the construction of the Egyptian Pyramids. The film itself does not have aura, but evokes the aura of the pyramids. Clearly, both the media technology used and the mode of presentation can contribute to the degree of aura that is evoked. The media form chosen (documentary or action film, *in-situ* MR, desktop hypermedia, etc.) provides affordances and imposes constraints on the aura of the experience. An action film like *The Mummy*, while situated near the pyramids, takes advantage of our knowledge of ancient Egypt, but would not evoke the same sense of aura as a well-done documentary. Likewise, an MR application that allows the user to walk around the remains of the pyramids in Egypt should be able to leverage this physical proximity in a way other media (including our previously mentioned

documentary) cannot. The choice of the mode of presentation (descriptive text, third-person narrative, dramatic mode) should also affect the aura evoked by the application.

To sum up, we could envision various media presentations of Oakland using traditional as well as digital technology: an MR experience, a historical photograph, a historical painting, a VR experience, a desktop multimedia presentation, and a traditional film documentary. Each of these presentations might evoke some of the aura of Oakland, but they would do so in very different degrees. The relationship between the content of an experience, the media form, and the user is sufficiently complex that it is not possible to construct any simple scale of technologies and their ability to evoke aura. In fact the relationship between media form and aura raises a number of research questions.

3.1 Enhancing aura

If users are not aware of the significance of a place or object, they will not experience aura. This is especially true in educational applications. For example, many visitors to the Oakland cemetery would not know about many of the significant aspects of cemetery (e.g., history, art, architecture, famous residents). Thus, most of the current tours explicitly try to enhance the aura by presenting a variety of interrelated information to the user. This in turn requires adding to the user's existing network of knowledge by making new links: for example, connecting Oakland Cemetery to the user's knowledge of the Civil War.

3.2 Leveraging aura

We hypothesize that in order to leverage aura, a media experience must bring the object or place "closer" to the user. We suggest that auratic proximity cannot be measured simply by physical distance, but rather by the user's perception of their relationship to the object or place. While we expect users to feel the aura most strongly if they are in the same physical place, any media experience that engages the user sufficiently can leverage aura.

We cannot assume, therefore, that "better" (e.g., more visually accurate, more interactive, etc.) media technologies necessarily correlate with a greater sense of aura. As noted above, the perfect VR environment, the Star Trek holodeck, would achieve the illusion of the absence of mediation and induce a high degree of presence, but because the user knows the environment is an illusion, the holodeck might not evoke the aura of the place being simulated. Older, less sophisticated technologies may evoke greater aura because of our cultural assumptions about them.

For example, from the later nineteenth century until recently, our culture has usually assumed that (in the absence of "tricks") photography showed what was "really" there [17]. Because of this widely shared assumption, a photograph may still be regarded as better at evoking aura than a computer graphic image, even if the photograph is a grainy, black-and-white image—indeed precisely because it is grainy and black and white. When we look at a
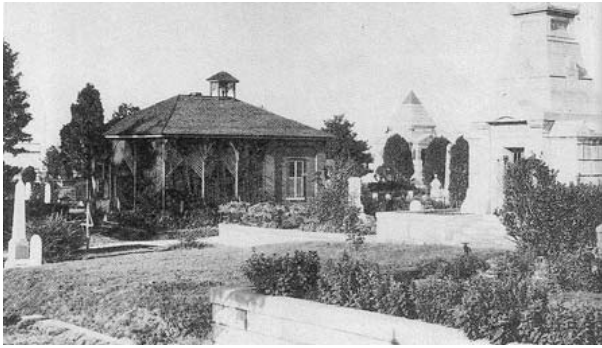
Figure 2. A 19th-century photograph may evoke a greater sense of aura than a more detailed computer rendering (from [26]).
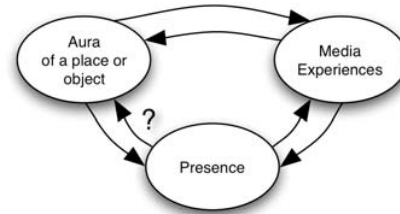

Figure 3. The relationship between aura, presence, and media. Immersive media experiences generate presence, and presence makes media experiences more compelling. The relationship between aura and presence is more complex.

photograph of Oakland Cemetery taken in the 1890s (see Figure 2), we have a heightened sense of the history of the place. The "poor" quality of the photo contributes to the sense of aura. Looking at this photo, we feel closer to the historical Oakland than we would by looking at a high resolution, 24-bit color computer graphic, even if the graphic is an historically accurate representation.

4. Aura and the mediation of presence

The technology of mediation is an important factor for both aura and presence. As we remarked above, if presence is defined as a sense of being in a physical place, then one might be tempted to say that MR applications get presence "for free." The subject in MR always has a sense of place and therefore always has a sense of presence.

But in fact, even in an MR experience, the world is always filtered at least partly through media: the computer graphics, text, or audio that augment the user's view of the physical environment. A VR experience is (almost) entirely mediated, since VR cuts off the user's ability to see and (often) to hear the physical world. An alternative way to define presence, then, is to focus on the user's capacity to forget about the mediating technology.

This is the strategy of Lombard and Ditton and some other presence researchers. The website for the International Society of Presence Research defines presence as "a psychological state or subjective perception in which even though part or all of an individual's current experience is generated by and/or filtered through human-made technology, part or all of the individual's perception fails to accurately acknowledge the role of the technology in the experience." (see http://ispr.info) According to this definition, the key aspect of presence would be the illusion of non-mediation or transparency. Some researchers prefer an operational version of this definition, in which an application has presence if the user acts and reacts as if she is in the corresponding real world setting.

If presence is defined with Lombard and Ditton as the feeling of the absence of mediation, then MR applications can have more or less presence, just as VR applications do. An MR application combines the physical world with a virtual world. If the combination is seamless, then the user could experience a high degree of presence. However, the illusion of presence (the integration of the physical and virtual) can be broken by technical or design based problems and inconsistencies in the experience. Lag in the tracking system might cause virtual content to fail to remain registered with the physical world, while the lower resolution of a virtual image might stand out dramatically against a real object. Even when the technical aspects of the experience are perfect, inconsistency, lack of realism, or poor design of the sensory and behavioral aspects of the virtual elements could cause breaks in presence.

Although presence and aura are clearly related (both are psychological responses of the user to the experience), the relationship is not simple or unidirectional. The relationship is also related to the nature of the media technology used (see Figure 3). It seems to us that aura can enhance presence. It also seems that in some cases presence can increase the aura by making the object or place seem closer. Yet, the user's knowledge of and personal relationship to the place are probably more important than presence for generating a feeling of aura. Consider the various media technologies that could be used for an experience in Oakland Cemetery. A desktop multimedia experience would be relatively low in the sense of aura as well as in presence. A VR version of the Oakland cemetery experience would be higher in presence, and for this application, we suspect that the greater the presence, the greater the sense of aura. Yet neither of these experiences may evoke as great a sense of aura as an historical photograph of Oakland Cemetery, such as the one in Figure 2. Put another way, a generic VR application could conceivably achieve a high degree of presence through perfect immersion without evoking much or any sense of aura in the user.

5. Aura, space, and place in mixed reality

The concept of aura also bears an important relationship to the concepts of *space* and *place* in MR systems (following the terminology of Harrison and Dourish [9]), which are both situated in and defined by their relationship to the physical world. Much has been written about the practical benefits of MR related to leveraging the physical, perceptual, and social affordances of being in a physical space. At the most basic level, MR systems try to directly leverage our physical and perceptual abilities and

the corresponding affordances of the space in which they operate. For example, the URP system [28] allowed the designer to physically manipulate the various inputs to a simulation of an urban space. The KARMA system [7] leverages the user's perceptual ability to merge maintenance instructions with the physical equipment on which they are superimposed.

Physical spaces and objects also offer social affordances, such as eye-to-eye contact and other physical cues, that we unconsciously leverage during our social interactions to signal interest, negotiate conversational flow, and so on. These affordances have been studied extensively in the context of distributed collaboration [20] and media spaces [9]. They have also been demonstrated in tangible interfaces like the Designer's Outpost [12] and the Augmented Flight Strips [15]. In these systems, the users work directly with physical props that are transparently linked to their virtual counterparts and leverage the existing social dynamics of the groups to enable them to manage a larger number of objects than they could with a non-tangible system.

Over the past several years, researchers have developed a sophisticated understanding of the user's relationship with their work environment in MR systems and have developed the concept of "place" to describe that relationship [9][18]. Harrison and Dourish refer to the often-implicit social and cultural meaning of a space as its *placeness* [6]. They argue convincingly that the shared meaning, and therefore mutual understanding, which people attach to real *places* is what designers are often seeking when creating MR systems. Research has focused on the implications of place with an eye toward deep integration of information technology into work settings. While Harrison and Dourish do consider places that have personal significance for the user, such as homes, they focus on design applications that do not exploit the unique characteristics of such places.

As we would expect with an influential concept, research has led to suggestions to nuance the distinction between place and space. In addition to the BENOGO project cited above, Perry and Brown have discussed the concepts of place and space in the context of personal geographical-based information systems (that is, maps and guidebooks) and argued for a more subtle understanding of the relationship of between place and space in context-aware design [5]. Both maps and guidebooks and have elements of both place and space. What interests us here is movement toward a concept of aura. One important purpose of a guidebook is to inform the user about the special historical and cultural meaning of a particular place. Guidebooks enhance aura as they augment the user's sense of place.

Such work points to a lack in the current conceptual framework. Just as place was developed to supplement the concept of space, we believe that place now needs to be supplemented by the concept of aura. In previous research, the concept of place has been applied most often to the social context and meaning of the workplace environment. Harrison and Dourish's key example is media spaces, such as the PARC environment. The PARC system functioned in researchers' offices, which were fitted with cameras and audio links to allow researchers to interact without being in the same physical location. The concept of place is well suited for describing the user's relationship to such spaces for CSCW, because the offices had no cultural significance, although they were differentiated by personal use.

For a new class of applications, where the digital technologies are used for entertainment and informal education in well-known cultural settings, we need a new concept like aura. Just as place provides an analytical tool for understanding and improving CSCW, aura provides a tool for understanding and improving experience design.

5.1 Aura and embodiment

In addition to the concept of place, Dourish has stressed the importance of embodiment in application design. He argues for a new paradigm, which he calls "embodied interaction," an approach that combines elements of tangible computing and social computing [4][6]. Embodiment is also a key aspect of aura. The importance of embodiment was made clear in Benjamin's original formulation, when he claimed that aura was generated by the "here and now" of the place or object. "Here and now" describes the immediate, embodied presence of the object or place.

Tangible computing explores ways to incorporate the virtual information provided by the computer into the user's physical environment: in short, how bits can become embodied. The design strategies of tangible computing have been applied to generic work situations (KARMA [7] or Flight Strips [15]) in which the computer can display information on the user's physical environment or gather information from the user's physical interactions. In most cases, therefore, tangible applications explore the physical affordances provided by generic objects (printer parts, paper flight strips), not by culturally unique objects (such as particular paintings or the artifacts of a particular battle). AR experience design can be seen as a new form of tangible computing in which the success of the interaction depends on the uniqueness of the object or place.

A similar qualification can be made in regard to the other aspect of embodied interaction. Social computing usually refers to the use of digital tools to foster the negotiation of social meanings – again, the typical case would be CSCW. Dourish explains how communicative meaning is achieved through negotiation among the users of such systems. AR experience design, however, can be seen as a form of social computing in which the applications are representations rather than tools and have a symbolic meaning within the culture. For that reason it might be better to call the design strategy "cultural" rather than "social" computing.

Such cultural applications do not necessarily offer their users an equal role in the negotiation of meaning. A negotiation of meaning occurs between user and designer similar to that between a playwright and an audience in dramatic presentation. That negotiation takes place at the interface between the virtual and the physical aspects of the experience, because the user must interpret what the virtual elements mean in this particular physical context. For

example, in a dramatic experience presented in the Oakland Cemetery, the designer might create virtual characters that represent ghosts of people who lived in Atlanta in the 19th century. The user would interpret the status and meaning of these characters, according to many of the same conventions that she would use if she were watching a drama in a theater. The principal difference is that she is not seated in a theater, which is in fact a space that the drama asks her to imagine as a particular place. Instead, she knows that her body is located in the actual space of Oakland, which she shares with the virtual characters. The user's embodied presence at the site adds a vividness that distinguishes AR experiences both from conventional stage drama and from social computing applications in the workplace.

6. Future work

Like presence and place, the value of the concept of aura will become apparent if it proves useful for analyzing a class of media experiences with the eventual goal of improving them. For example, one of the appeals of computer-augmented tours has been the potential for customizing experiences for each visitor, based on simple demographic information. We believe that the framework of aura can provide guidance on how to approach the problem of what data to collect and how to customize the experience. One version of tour of a famous battlefield could be designed assuming recent familiarity with war. Depending on the region in the world a visitor is from (e.g., Eastern Europe), the content could be related to the current conflicts (e.g., the conflicts following the fall of the Soviet Union).

At this initial stage, however, there are many research questions regarding aura that must be addressed if the concept is in fact to become useful as an analytical design tool. First, the interrelationship of aura and presence suggests that both of these concepts could be thought of as aspects a more general concept that we might call "engagement." Although presence has generally been applied to VR, we could also step back and refocus on the more general definitions of presence as a measure of engagement in any computer-mediated experience, not just perceptually immersive media such as VR (e.g., people are frequently "completely immersed" in books, movies, and computer games).

Second, there is the question of how to best measure aura. It seems that, at best, aura can be measured qualitatively. Because aura, like presence, is a psychological condition of the user, it should be possible to use similar techniques to those used for presence. In particular, questionnaires and think-aloud protocols have been developed for presence and are widely used [32][25]. The BENOGO project has put forth evaluation techniques for their concept of contextualized presence, and these might be modified to assess aura. While we hope that a general set of questions can be devised to measure aura, it may be that the site-specific nature of aura requires evaluation instruments specific to each place or object.

Finally, the development of instruments to measure aura would allow us to ask a set of questions about the correlation between aura and other properties of the experience. For example,

1. Is there a direct, positive correlation between aura and presence in an MR experience?

2. What effect does aura have on the user experience (i.e. increased learning or engagement, as might be implied by studies of *in situ* education [23])?

3. Does user participation enhance aura or not? Among HCI researchers and experience designers, interaction is generally held to be a good or even necessary feature of digital applications. But does participation enhance aura in a media experience? The question is worth asking, because, for example, it is not clear that allowing a visitor to touch the Mona Lisa in the Louvre would enhance her sense of wonder at the painting. It might have the opposite effect.

6. Conclusion

Aura is a defining feature of a class of culturally and personally specific applications for entertainment and education that can be used formally and explicitly in various forms of experience design. All media technologies should be able to leverage and extend the aura of a place or object for a person, although MR technologies that create situated experiences would seem to do so more readily.

There are two key points to remember regarding aura. First, aura arises from the significant historical, cultural and personal aspects of a place or object, in contrast to the more generic social and cultural constructions associated with all instances of the place or object. Second, aura is a relationship between a person and the place or object—media experiences do not in general have aura, but can leverage or enhance the aura a person feels.

The concept of aura provides an important complement to presence and can enrich our understanding of users' responses to a variety of different computer-mediated experiences. In addition, aura can serve as a bridge to relate the VE research in presence with the research by the MR and CSCW communities on the concept of place.

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