Accessing material art through technologies of mediation and immediation

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Abstract

In this paper, we explore touch technologies and the kinds of engagements with art that they enable. We discuss implications of using these technologies, and technology more generally, to access art via electronic displays within museums and galleries and outside of museums over the Internet. Our discussion is put in the context of how museums, both now and in the past, have constructed experiences of objects. We trace a trajectory from museum environments in which all senses were active to contemporary ones, which are purely visual. We argue that emerging technologies can be used to reverse this movement.

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1. Introduction

The word medium and its cognates, such as media and mediation, have a strangely double aspect. On the one hand, a medium acts as an enabler, as a bridge, connecting things that might otherwise be completely disjointed. On the other hand, a medium is something that palpably stands between. Mediated experience is always second-hand; mediated experience is, by definition, not immediate. Even air as a medium through which we apprehend the world distorts. Worry about this led David Hockney, for example, in the late-1980s, to prefer photocopiers to cameras as he felt that the images produced by the latter were largely pictures of the air between the camera and the subject. The technologies of what might be called new or digital or interactive media have been intense cases of this doubleness, but this may change.

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In 2002, researchers at the Touch Lab at MIT shook hands across the Atlantic with researchers at University College London (Fig. 1). They shook hands using a fast computer connection, pressure sensors and actuators. That handshake may well herald a new era in communication across the Internet and could also be the harbinger of new ways in which we experience other people and objects through technological mediation. This change is much more fundamental than simply adding one more sense, arguably a relatively minor one at that, to the array of senses with which we interact with computers.
Touch is very different from the senses—vision and audition—that, up to now, have been almost the sole ways of accessing the world through computing technology. The difference is bound up with the notion of distance and mediation. The things we see and the things we hear, even when not apprehended through machines, are almost always at some remove from us, mediated at least by air; the things we feel are things that are in contact with us, things that are touching us as we touch them.\(^1\) Once immediate senses—like touch and taste—are added to the engagement with computers, the experience becomes manifestly more immediate, more participatory, more part of a real world.

In this paper, we discuss possible future technologies and the kinds of engagements with art they enable. The discussion will include an exposition of the emerging technologies, privileging our own and others’ development of tools and techniques that simulate and broadcast the feel of an artefact. We will discuss ramifications of these technologies, and technology in general, to art access via electronic displays in museums or galleries and, by implication, through the World Wide Web.

To put these issues in historical context, we will briefly outline the role of technology as mediator in our engagement with art and also the kinds of access to art that museums and galleries have traditionally afforded.

2. Museums and engagement with art

We think of museums as quiet, stately places, to be approached in sober and reverent attitude, our relation to the objects inside respectful, reverent, silent. As Theodor Adorno somberly observes: “The German word museum (museum-like) has unpleasant overtones. It describes objects to which the observer no longer has a vital relationship and which are in the process of dying. They owe their preservation more to historical respect than the needs of the present. Museum and mausoleum are connected by more than phonetic association. Museums are the family sepulchres of works of art [1].”\(^2\) Merleau-Ponty [2], in similar vein, refers to the museum as a “meditative necropolis”. Foucault, too, speaks of museums in the same breath as cemeteries, both are used to exemplify his notion of a heterotopia, of a place in between, of a place that is outside of the usual cultural relations but important to them. To Foucault, modern museums are places dedicated to “indefinitely accumulating time”, of expressions of “the will to enclose in one place all times, all epochs, all forms, all tastes...constituting a place of all times that is itself outside of time and inaccessible to its ravages” [3]. We do not want to follow the implications of this to a project of classification and control, but rather what we want to take from here is the description of museums as odd and ultimately inaccessible places, places that neither partake in life, nor in which life partakes. This feeling pervades the dominant ways in which we interact with museum spaces, with other visitors in these spaces, and with the artefacts within museums. Visitors may look, but not touch, hear sound but only through headphones. Silent, awed, sight is the dominant mode of engaging with cultural values in the modern museum or gallery.

\(^1\)Spiders are one of the animal that routinely feel things at a distance. Spiders do this, fittingly, by feeling things on the far corners of their webs.

\(^2\)As my (Zimmer’s) son, Edmund, noted, reading over my shoulder, the phonetic resemblance to which Adorno refers has no etymological significance as Museum derives from the muses and Mausoleum from the tomb of Halikarnassos (traditionally identified as Maussollos, hence the word). The remains of the eponymous mausoleum, incidentally, are in the British Museum.
But the Foucault essay already cited reminds us that things were not always so, that our way of constructing and approaching museums developed only in the nineteenth century. As Foucault writes: "the project of organizing in this way a sort of perpetual and indefinite accumulation of time in an immobile place, this whole idea belongs to our modernity. The museum and the library are heterotopias that are proper to western culture of the nineteenth century." Prior to that, collections tended to be unashamedly idiosyncratic and personal. The history of collections is seen here as a manifestation of the move from renaissance humanism to modernity. But for the purpose of this essay, we will put that aside and rather reflect on the various experiences intended, and provided, by these different kinds of collection.

Eighteenth century collections, gathered from The Grand Tour or otherwise, were expressly meant as stimulants of intelligent, enlightened as it were, conversation. Earlier still, cabinets of curiosities in the early modern period promoted multi-sensory interaction with a great variety of objects. Initially known as Wunderkammern these rooms were arranged higgledy-piggledy, objects jostling each other to gain visitors’ attention. Such cabinets were laid out with no scientific or art historical regulation. Collections of curiosities, both natural and man-made, offered visitors a glimpse of a much larger world and one that they had no way of experiencing before. And experience with the world provided by these spaces, while attended with wonder, was not intended to be passive. In cabinets of curiosities, objects were meant to be handled, smelled, even tasted, as well as seen. In comparison, as Constance Classen elegantly puts it: “The modern museum, dating from the nineteenth century, is characterized by an ambience of sensory restraint. Visitors may look but not touch.”

3. Touch and mediation

The concentration on the visual is a feature of much of the thinking about history, and the history of art, that is inscribed in the very architecture of museums and the collections they house. The literature on aesthetics and art history focuses largely on sight. This is, in itself, an instance of a much larger, all-pervasive, phenomenon sight has been privileged as the highest sense. In a culture of visuality, touch has only recently re-emerged to take a place in the forefront of the senses. We speak of this as a re-emergence because the place of touch in the hierarchy of senses has not always been so unambiguously low. Indeed, touch has sometimes been singled out as the sense that most differentiated people from the lower animals. Consider, for example, the following, written by Pierre Charron in 1608 and quoted in [6]:

In the Senses of Nature the beasts have as well part, as we, and sometimes excell us: for some have their hearing more quicke than man, some their sight, others their smell, others their taste: and it is held, that in the sense of Hearing, the Hart excelleth all others; of Sight, the Eagle; of Smell, the Dogge; of Taste, the Ape; of Feeling, the Tortuis: nevertheless, the preheminence of that sense of Touch is given unto man. [7]
But even here the endorsement of touch is tainted. Charron continues:

Nevertheless, the preeminence of that sense of Touch is given unto man, which of all the rest is the most brutish. Now if the Senses are the means to attain unto knowledge, and that beasts have a part therein, yea sometimes the better part, why should not they have knowledge? [7]

Touch, this same sense that raises us above animals, is paradoxically the most bestial.5 The brutish-ness of touch is related to the disappearance of the immediate senses from the history of museums and collections, rehearsed above. In any world-view in which the bodily is regarded with suspicion and distaste, the immediate senses will always be brutish in comparison to the mediated, airy, seemingly cerebral, senses of seeing and hearing. The implied hierarchy in which touch is more animal-like is matched by the way we value cultural artefacts. While the immediate sense—touch, smell and taste—are prevalent in the art and aesthetics of non-Western cultures, traditional non-Western multi-sensory works have been customarily marginalised as primitive or folk or else reduced to the purely visual. Howes and Classen [8] cite the instance of Navajo sandpaintings, which have been incorporated into Western museums and aesthetic discourse as object of the gaze, while for the Navajo, their tactile quilts are fundamental.

What is being denied in the reduction to the visual is the possibility of intimate, engagement with cultural artefacts. Marinetti [9] in The Manifesto of Tactilism, discusses textiles, specifically woven ones, in terms—texture, weight and volume—that are most closely associated with the feel of an object than its look. While the visual provides only distant access to textured surfaces, such as woven structures, the haptic6 defines the affective charge—the felt dimensionality of a spatial content. Touch also partakes more easily in a replaying of the production of the artefact. Mădălina Diacon suggests that work made by hands in general is a poiesis by means of gestures. She writes against the paucity of experience offered by the modern museum: “what might still justify the interdiction against touching the objects in museums, apart from practical reasons such as preserving the works as material objects? Why are visitors not permitted to follow the artist’s gestures with their own hands? There is a knowledge that is waiting to be awakened at the tip of our fingers, and the museal prohibition of touch inhibits natural cognitive impulses” [10]. She goes on to claim that a touch-based aesthetics puts the kind of museum to which we are used under great stress: “Therefore, an aesthetics of tactility places the status of the museum itself as a specific modern institution at stake, and stimulates creativity in designing exhibition sites that not only permit viewers to touch the objects but even require it as part of the corporeal engagement with them” [10]. The aesthetic encounter with objects is a way of informing our tactile sense as well as the visual, how the senses are combined in our phenomenological perception of the world refers us back to embodied tactile-spatial experience.

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5That touch is more intimately bound up with intense sensation and affect, with both pleasure and pain, hardly needs to be pointed out.

6The adjective haptic comes from the Greek haptikos, from haptesthai, to grasp, touch, and means pertaining to touch. The noun haptics, obviously form the same root, is used to denote the study of touch or the subject of touch-based computer interfaces.
Alois Riegl, an art historian and an early curator of textiles wrote, in the late nineteenth century, of a vision-based aesthetics that has at heart what Diacon might call “an aesthetics of tactility”. Riegel preferred the word *haptic* to *tactile*, perhaps finding *haptic* more abstract, broader, and less likely to conjure up an image of literally touching. In [11], Riegel developed a notion of *haptic vision* or *haptic looking*, which denotes gazes that move across the surface of things—rather than the fixed and fixing stare of high modernism—perhaps lingering on a specific detail or textured grain. A haptic look is a grazing mobile glance that generates an intimate exchange between artist, work and audience. What is generated is the possibility of an imagined affective touch. What Riegl suggests here is that there is a plane of feeling and potential experience that is distinct from actual contact. A surface texture stimulates sensation on the outside of the body (hence the expression making one’s hairs stand on end) but inside the skin, it is introception, an aspect of the haptic sense, which perceives viscerality.

Deleuze and Guattari [12] extend Riegel’s definition of the haptic, suggesting that *haptic* entails a working together of senses, in opposition to *tactile*, which seems to imply isolation of touch. They further suggest that the haptic entails the faculty of touch in space and time and it is the haptic that changes affective relations. It enables, for example, the perception of spatial depth. It is multi-perspective, surrounding and pervading objects in the world. This centrality of the haptic is even more fundamental in Phenomenology. To Heidegger and Merleau-Ponty, the perception, indeed the make-up, of objects or *things* arises from the body’s interaction with the world. Thinking with the eyes and the hands together generates an embodied experience of space. Forms shape. This causes us to experience embodied perception that highlight how the senses are joined up, particularly of touch and space. To Merleau-Ponty, indeed, the sensations are undifferentiated. He writes, for example, about Cézanne’s paintings.

Cézanne does not try to use color to suggest the tactile sensations which would give shape and depth. These distinctions between touch and sight are unknown in primordial perception. It is only as a result of a science of the human body that we finally learn to distinguish between our senses [13].

Here we have the haptic imbedded within the experience of engaging with the painting. We are obviously not physically touching the painting, still less the subject of the painting, so the sense of touch must be part of our processing of the purely visual stimulation. This is part of a generalised idea of haptic, like that given by Iris Marion Young as “an orientation to sensuality as such.” Young writes:

> Touch immerses the subject in fluid continuity with the object, and for the touching subject the object reciprocates the touching, blurring the border between self and other...Thus we might conceive a mode of vision, for example, that is less a gaze, distanced from and mastering its object, but an immersion in light and color. Sensing as touching is within, experiencing what touches it as ambiguous, continuous, but nevertheless differentiated.

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It is not surprising that in the process of moving towards a tactile aesthetics, Riegl broadened the range of objects to be studied to include the applied arts and ornament to promote cultural pluralism.
within, experiencing what touches it as ambiguous, continuous, but nevertheless differentiated.⁸ [14]

This is, in our terms, the possibility of vision as an immediate sense. This may seem an endorsement, at least a potential endorsement, of the visual as a way of apprehending art but it is not entirely one. Consider again the observation of David Hockney from the beginning of this essay. Hockney worried that the air between the camera and subject mediated. In the Young quotation, the very air—its light and its colour—are the proper subject of vision. If we want to provide full engagement with museum artefacts, we need to have the visceral experience of the objects themselves, not with the air in between.

4. Touch media and museums

The overarching question in the research trajectory in which this paper is a part is: how naturally can we incorporate visceral experience of touch into a technologically enabled engagement with art and artefacts? This research involves building technologies, modelling cognitive processes, and will, eventually, involve empirical studies of people using these technologies to engage with, and to produce, art. We are working towards closer, more immediate, and deeper access to objects for museum visitors, art researchers and general computer users. As part of this, we are in the middle of a project⁹ developing computer-supported access to the feel of textiles, allowing computer users virtually to feel textile objects that are either too delicate or too distant to feel directly. This will lead to a future in which people will be able to access, not just the two-dimensional look of an object, but also its feel. In this section, we will outline our plans for expanding touch interfaces to make them able to provide immediate access in a museum setting or at a distance. But first we will explain what we mean by technologies that enable touch and what the current state of these technologies is.

4.1. Touch technologies

The technologies we are dealing with are various forms of touch, or haptic, technologies, by which we mean interfaces to computer systems that allow the user to feel a three-dimensional rendering of an object in the same sense that screens allow computer users to see two-dimensional pictures of an object. Actually, this is only part of the story because, unlike the analogy with visual interfaces, in true haptic interface the computer would be able to gather information from the way the user is exploring, gripping, or pressing an interface device. The duality of the computer sensing you as you sense it is bound up with the whole notion of immediation, discussed above. But for the purposes of this paper, we will concentrate on haptic output, on feeling objects and other people through a haptic interface.

⁸We are indebted to Paterson’s [15] essay (some reprinted in [16]) for pointing out Young’s view on haptics. Indeed, much of our discussion of Merleau-Ponty and Heidegger is heavily influenced by Patterson’s essay.

⁹Supported by the Engineering and Physical Science Research Council, to whom wish to express our gratitude. The initial support was through a one-year project called Intimate Technologies. The sponsorship enabled Mandayam Srinivasan, director of the Touch Lab at MIT, to visit Goldsmiths, both to the Constance Howard Research and Resource Centre and to Goldsmiths Digital Studios.

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Haptic interfaces use mechanical components, called actuators, to apply forces to the user. The forces match those that the simulated object would exert on you if you were touching it with the same pressure that you are exerting on the interface device. The object in question is modelled and encoded within the computer’s memory. The model incorporates the shape of the boundaries of the object and some of properties of the materials with which the object would be or is constructed. The shape and material together determine how much the object would push against you in response to your pushing against it. For example, a wooden table pushes much harder in response to your pressing it than a folded towel that sits on top of the table would do. The forces need to be computed in real-time and then sent to the actuators so that the user feels them. Somebody using a haptic interface feels a simulation of a solid object, mimicking the feel of the real object analogously to how a digitisation of a picture mimics the picture of which it is a digitisation.

The most prevalent system along these lines—the Phantom, developed and marketed by Sensable Technologies—aims at simulating one-point feel. The interaction with the computer either simulates the experience of feeling with your fingertips by use of a thimble on the end of your finger or simulates the feel of using a grasped tool, like a pen, a chisel, or a scalpel, used as a probe. The Phantom has six degrees of freedom. There are three that represent translations: up and down, side to side, and back to front. There are three that represent rotations: pitch, which is rotation around the lateral or transverse axis (this is like casting a fishing line or pitching a baseball); roll, which is rotation around the longitudinal axis—an axis drawn through the body of the probe or finger (this is like using a screwdriver), and yaw, which is spinning or pivoted around the centre of mass (like a spinning top on a table).

The Phantom is quite accurate and there is a range of experiences that can be successfully simulated with it. It can be used to mimic any activity that works with one-point interactions, such as surgery. There have been a few pioneering attempts to use this technology both as an input to making art, allowing somebody virtually to sculpt an object that can then be realised on a three-dimensional printer, and also to provide access to cultural artefacts in a museum. For example the University of Southern California’s Fisher Gallery explored the use of the Phantom device to allow visitors to feel an exhibition of daguerreotype cases [18]. The same research group has opened up a Haptic Museum, also at USC, in which all the exhibits are touched through haptic devices. They see this as a way of opening out the appreciation of artefacts:

Our team believes that the ‘hands-off’ policies that museum impose limit appreciation of many cultural artefacts, where full comprehensons and understanding rely on a sense of touch as well as vision. Haptic interfaces will allow a fuller appreciation of material objects without jeopardizing conservations standards” [19].

Another exhibition that was based around touch, both direct and mediated by technology, was the Touch Me: Design and Sensation exhibition at London’s Victoria and Albert Museum in 2006. In some ways this exhibition serves as an object lesson in the problems of having technology as the central point of a public exhibition as so many of the exhibits were broken by the end of the exhibition that the museum to reduce the ticket

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10See [17] for a fuller explanation.
price. But this experience also reminds us how badly technology is needed if we are to allow touch without compromising delicate museum objects.

It is easy to over-estimate how near we are to providing this experience. Stephen Brewster, for example, describes the experience of the Phantom and its potential use in cultural heritage as follows:

[The Phantom] provides a programmable sense of touch that allows users to feel textures and shapes of virtual objects, modulate and deform objects with a very high degree of realism. One of the key (and most compelling) features of the PHANToM is that it can model free-floating three-dimensional objects—for example, a user of the PHANToM could feel an object such as a Roman helmet from all sides—front, back, top, bottom—just as if holding it in his/her own hand [20].

This is something of an overstatement: you cannot use the Phantom to get the feel of holding an object. You can only get the feel of probing or poking an object. But we would like to do more: if not quite holds the object, we would at least like to be able virtually to stroke it.

4.2. Pin arrays

A first step towards a simulated sense of stroking is provided by tactile displays, such as those made from pin arrays. With these displays a user will feel forces applied directly to his or her skin. A pin array is a collection of small pins that are fairly densely packed and each of which can independently move slightly either up and down.11 These devices give the sensation to your finger or hand of touching a textured. It gives no sense of the object other than superficial properties of the surface.

We are working toward a hybrid tactile display that wills both a global sense of shape and harness as well as a local sense of texture. The hybrid system will bring together force-feedback systems and haptic displays in an integrated system that will be sensitive enough to simulate the experience of really feeling different objects and of stroking different textile textures, weights, and volumes.

4.3. The future of touch technologies

In order to simulate the touch and feel of a textile realistically, it is important not just to provide an overall force feedback but also to provide spatio-temporal force patterns to the human finger pad, moving the pins in the tactile array so that it approximates the skin deflections and vibrations that humans perceive during contact with real shapes and textures.

The system will consist of three main devices, namely, (a) a force feedback device (Phantom), (b) a graphical display (computer screen) and (c) a tactile display array. The force feedback device will provide position control of a virtual finger and will be used to

11We are starting with one developed by Kyung et al. [21]. The tactile array offers flexible stimulating frequency in wide range (static to \( \sim 325 \text{ Hz} \)) with a normal displacement (\( \sim 700 \mu \text{m} \)), large enough to feel even at low frequencies. The additional importance of this tactile array display is that it is small enough to mount on existing force feedback devices such as the Phantom. The 30 pins, which lie on 1–2 mm centers, were made by Stereolithography (SLA). Efforts to minimize the weight of the materials and wiring produced a design with a finished weight of only \( \sim 11 \text{ g} \).
interact with a three-dimensional textile model displayed on the screen. A detection algorithm determines the collision between the virtual finger and the textile model and a collision response is generated. The response is three-fold and will consist of (a) a gross force computed and fed back to the force feedback device, (b) a spatially distributed force according to specific mathematical algorithms which is fed back to the tactile display array and (c) a graphical deformation of the textile model which can be seen on the screen.

This system will provide an engagement that, while mediated by a computer system, is in a real sense is immediate. We will have real touch to the skin, reinforcing the visual display. This will enable, even at a distance, integrated touch and sight, enabling what Riegl calls haptic vision and allowing us to develop touch-based aesthetic experience.

5. (Im)mediate(d) access to art in museums

To date, the experience of technology in museums and galleries has been, at best, mixed. The lure of technology does make the experience of going to a museum or a gallery alluring to some who would otherwise stay at home. Technology has also been used effectively, at times, to provide context and to enrich the informational content of a museum experience. However, these benefits come at some cost. The technology can easily become the focus of the visit, distracting the visitor from the objects he or she has come to engage with. The initial studies of the PDA project at Tate Modern, for example, do suggest that many people walk through the exhibitions, hardly looking up from their PDAs. And the experience afforded by digital technologies is usually sensually and socially impoverished.

As we have argued above, this impoverishment is, to a large extent, inherited from our engagements with museums in general. These problems, therefore, do not mark a schism between the role of the museum and role of new technology, but rather the two tend to reinforce each other. The introduction of interactive technology can, in principle, be a way of offering new experiences of museums and their material collections, leading to richer engagements with objects and with other museum visitors. This does sometimes happen, as witnesses by an exhibition in the Field Museum in Chicago in 1999.

The exhibition, which was called Sounds from the Vaults, displayed some of the museum’s collection of ancient instruments from different cultures, a collection that was created over a century. These instruments are being conserved as rare, and sometimes delicate, artefacts and would certainly not be played as a matter of course. Many of these sounds have not been heard for 100 years. What would be clear to most curators is that it would be important for visitors to be able to hear, as well as see, the instruments. The obvious way of doing this is to have recordings of professionals playing each instrument with concomitant use of technology as the way of accessing these pre-recordings. The exhibition did have such recordings. But they also did something else: they made digital simulations of some of the instruments. This enabled visitors to make the sounds that the instruments would make: to, in effect, play the instruments. The interfaces to the digitised instruments were made easier for an untrained player than the actual instruments, so in that sense the instruments were not played themselves. But the visitors engaged physically with aurally faithful simulations of the instruments to make the sounds the instruments could make. So, here we have a technologically enabled, meaningful engagement with the collection.

But it does not stop there. What the curators, Bruce Odland and Sam Auinger, did as well as to bring groups of instruments together in the same room and enabled all the

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people in the room to hear each other’s engagement with the digital instruments. This led to impromptu jam sessions on these simulated ancient instruments. In this exhibition, people used the technology to interact with each other focussed on the sound of the original instruments. We think that this serves as a model for exhibitions. We are looking forward to a future in which museum visitors will, through the mediation of technology, interact with each other, using multiple senses, in ways that draw attention to important aspects of the artefacts themselves.

6. Conclusions

We began this paper with the recollection of the handshake across the Atlantic, the first instance in which somebody in one place could physically feel the presence of somebody in a distant place. This is only possible using electronic and mechanical technologies and computer connections. We have finished by describing an exhibition that used digital simulations of the sound of old instruments to bring them to life. The key to the exhibition’s success was not just reviving the sound. It was a necessary part of the exhibition that there were interfaces to these simulated instruments that involved bodily engagement, even if not a simulation of the physical engagement with the original instrument. It was also crucial to the success of that exhibition that the effects of one person’s playing an instrument were felt by others, who could then respond to them.

We are working towards a future in which visitors and virtual visitors to museum exhibition will be able to interact with objects and communicate with each other using technologies that allow immediate. This is a goal shared by others, including McLaughlin at USC:

Our mission is to develop seamless, device-independent haptic collaboration such that a museum staff member and a museum-goer or art student at a remote location can jointly examine a vase or bronze figure, note its interesting contours and textures, and consider such questions as “Why did the artist make this side rough but that side smooth?” or “What is this indentation on the bottom for?” [19]

In our attempt to reach this goal we are developing new hybrid, natural haptic displays. Getting these interfaces right includes not only the invention of technology but also cultural study of the way people use technology, and material explorations of possible textile surfaces to be used as the skin of the display. The research trajectory is pleasingly circular as we will explore textiles that can be used in the design of computer peripherals that will be used to explore textiles from a distance. To close this loop requires serious interactions between engineers, computer scientists, cultural theorists, and those working in textiles.

Once we have a natural haptic display we will be able to touch objects that are either too delicate or too distant to touch directly. The access provided by touch is intimate and deep. It is not accidental that the words perceive and perception derive from the Latin percipere which means “to grasp”. Much of our deepest knowledge of objects and space come to us through touch, particularly the touch of our hands. As Focillon writes of the touch of the hand as opposed to the glance of an eye:

Sight slips over the surface of the universe, “the hand knows that an object has physical bulk, that it is smooth or rough, that it is not soldered to heaven or earth
from which it appears to be inseparable. The hand’s action defines the cavity of space and the fullness of the objects which occupy it. Surface, volume, density and weight are not optical phenomena. Man first learned about them between his finger and the hollow of his palm. He does not measure space with his eyes but with his hands and feet. The sense of touch fills nature with mysterious forces. Without it, nature is like the pleasant landscapes of the magic lantern, slight, flat and chimerical” [22].

The haptic technologies that are being developed will change the notion of space and of interaction. As telephones bring sound from a distance and televisions bring sight, we will be able to transmit and receive the sensation of touch. The reference to telephones in this context reminds us of the former AT&T advertising slogan: “Reach out and touch someone”. What the advertisement relies on is that touch metaphors do not only underlie the language of perception and cognition, they are intimately bound up with our feelings of intimacy and connection. In the future, the AT&T slogan will become more than a metaphor. There will be immediate interactions with objects and people that would be, without these technologies, distant or untouchable. Our engagement with the world, and in particular the world of art and cultural artefacts, through computers will be immediate, participatory, and natural.

References


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