Un musee à venir: What did we learn from the Louvre-Atlanta Exhibitions?

Heritage in the Age of Digital Humanities: How should training practices evolve?
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1. Introduction.

Although the Louvre-Atlanta exhibitions have been celebrated, the question of what was learned by this logistic and diplomatic feat of socio-cultural engineering has been asked in selective manner. Rather than registering the glamour of this prestigious project, we would like share what we have learned from a practiced engagement with it. Our paper involves observations on the future of the museum that were developed in conjunction with the Louvre-Atlanta exhibitions. Our objective is to identify several theoretical responses to the future of the museum, before going on to review an experiment in a digital prototype developed with students in response to the first exhibition.

The question of heritage comes into play immediately. 'Heritage' poses questions about origins, orientation and direction and requires one to consider the experiments undertaken in the past decade that explore the future of the museum. The image used by the Louvre to describe its decentralization–an *antenne*–deserves notice. Is this a mast intended for reception as well as transmission? Is it a hopeful gesture toward a network with an *antenne* being more a microwave amplifier similar to those cell-towers used to enable mobile telephones? One would hope the antenna to be more than a beacon for cultural zeal or an updated image of French missionary work in China, with the iconic Christian cross replaced by a transmission tower. If so, how are we to think of this *antenne*? If it is only mark of quality, the Louvre becomes the purveyor of a marketing model in which the circulation of art becomes synonymous with the circulation of money. There are other models, of course. There is an interest in creating a setting for a broad integration of visual heritage. Large museums can function as research centers for visualization and provide settings for a heritage of 'world' visual culture.[1]

2. Overview of the Louvre-Atlanta exhibitions.

Considerable commentary exists on the Louvre-Atlanta venture. It includes both praise and criticism, with the Louvre being accused of turning itself into a rental agency without true scholarly purpose, for Atlanta and other cities in the world. The public face of Louvre-Atlanta consisted of three exhibitions: 1. *Kings as Collectors* (October 2006 to September 7, 2007); 2. *The Louvre and the Ancient World* (October 2008-September 2009); 3. *The Louvre Today and Tomorrow* (October 2008-September 2009). More than 1.3 million visitors came to see the 493 objects exhibited.[2] The exhibitions showed how 'art' could serve as cultural capital whose circulation generates funding. The budget exceeded $18M, with $6.4M payment to the Louvre for renovation of the museum's 18th-century French decorative arts galleries. However the venture, as promoted, also provided the Louvre with an opportunity for considering the future of the museum at a time of rapid digital experimentation. In multiple statements, the museum sought to identify the exhibitions as a way to consider its future.[3] Henri Loyrette, its president and director, said he hoped the collaboration would yield fresh ideas that could be applied to the branch of the Louvre being built in northern France. "Yes, *we don't look at*

[1] The ecumenical vision of the Warburg is now being recognized in ways that not only involve microanalysis but a macro consideration of the human archive.

[2] *The Louvre and the Masterpiece* (Oct. 12, 2008-Sept. 13, 2009) drew more than 545,000; *The Royal Collections* (Oct. 14, 2006-Sept. 2, 2007), 446,752; and *The Louvre and the Ancient World* (Oct. 16, 2007-Sept. 3, 2008), 342,412. (AJC 9.22.09). The Louvre initially announced that the third year was to be devoted to 'The Louvre Today and Tomorrow," and would highlight "the development of the present-day Louvre and its new relations with society and the world." However, the exhibition was retitled *The Louvre and the Masterpiece*.

[3] Although not widely recognized at the time, the exhibition also served as a memorial to Atlanta art lovers who lost their lives in a plane crash in Paris. The 50th anniversary of the disaster was celebrated in 2012 and recognized that the High Museum may itself be viewed as a memorial to the disaster.

paintings this way," he said, referring to the way the High juxtaposed genres. "So it's also a new look on our collection, which is also interesting for us." (*NYT* 10/15/06)

The question of how the two museums look at their 'heritage' provoked us to ask what might be learned from a theoretical and practical engagement with the project. Support was obtained from the Georgia Institute of Technology for a series of lectures that would explore the future of the museum. A series of studio-workshops were planned in the context of Georgia Tech's highly successful graduate program in digital media, to allow students to explore ways in which digital technologies could participate in the future development of the museum.

3. Prototypes for Digital Intervention.

With the strong support of Georgia Tech and its Global Learning Center (GLC), prototypes were developed with a class of graduate students to explore the ways digital technology could reinforce the Louvre-Atlanta exhibition and its interest in decentralization and dissemination. Stages of development included steps toward:

1. The conception of a remote digital exhibition that would permit audience to view all paintings and objectives displayed in the High Museum in a remote location.

2. The design and development of a prototype exhibition using large high-definition monitors to be hung in the large plaza facing windows of the GLC.

3. The exploration of the ways that sensing technology could be used to enable pedestrian viewers to interact with the HD screens.

4. The integration of sensing technology with mobile phone technology that would allow viewers to upload images that could be shown together with objects in the Louvre-Atlanta exhibition.

5. The creation of Louvre-Atlanta web-based database and gallery, to include images uploaded by viewers.

6. The simultaneous development of a web-based exhibition, intended for distribution to public schools using a high-bandwidth cable link provided by Georgia Public Television.

In each case, the prototypes served as a means to explore the ways digital technology could enable an active response from the public, by going beyond its two dominant uses within the realm of heritage– either as a forensic tool and as an instrument or for the mere dissemination of information. At the heart of our preoccupations, the Louvre became almost like an enormous sunken vessel, to be viewed through the windows of the Nautilus. Might the encyclopedic Louvre not be seen as the collected universe presented by Jules Verne? Were our prototypes not circling sunken treasure and asking how this might be raised from the depths of art history? Were our own technologies not already part of the heritage we explored? The Louvre holds specimens that are continually placed under scrutiny enabled by an expanding range of technologies. Digital technology is not the first of these. It is part of a continuous intervention that is changing the conception of heritage and the ways in which it is made accessible.

We were disappointed by the lack of interest from the High Museum in Georgia Tech's effort to engage the Louvre-Atlanta exhibitions. It became apparent that the level of funding required for the exhibition proper was so large that very little would be left over for other initiatives, even if the Louvre had expressed an interest in using the exhibition as a means to ask questions about the future of the museum. In retrospect, our discussions with both institutions intensified our sense of the caution with which large museums have engaged all but the most conservative uses of digital technology. While the High Museum has fully embraced its use to enhance the presentation of its work within the practice of art history, much less has been done to foster the intervention of digital media in its own collections. Certainly, digital media continue to be celebrated as a staging vehicle for a museum culture committed to building shows that attract the public. The question is whether digital media will

also be used to contribute to the rebirth of the museum. As an encyclopedic museum, the Louvre confronts extraordinary challenges to maintain the enormity of its collection and be more than a 'library' of art.

4. Future of the Museum Lectures.

Our project of building prototypes that explored digital intervention in Louvre-Atlanta was complemented by a series of lectures devoted to the future of the museum by recognized critics and artists. Initiated in the spring of 2007, these were given at the High Museum by Barbara Stafford, Jane Prophet, and Yves Abrioux. The lectures (which are still available on the web through the High Museum) focused on questions of cognition, digital intervention, and the ideological exhaustion of the Enlightenment museum.

4.1 Cognitive science.

What does cognitive science mean for the future of the museum? For Stafford, the question carries an urgency underlined by the selective attention paid by museums to cognitive issues. How are museums to respond to neurophysiological research that shows that non-conscious activity constitutes 90% of brainwork? Inherent in this question is a recognition that museums have *already* responded robustly to the normative potential of all that involuntary brain function.

Cognitive research has contributed to the ways art may be treated as a commodity, via the metric study of movement through museum space, of consumption patterns, of the demand for restrooms, bookstore displays... Museum architecture offers multiple examples of the ways renovation has transformed museums from honey-combs of salons for exhibiting permanent collections to museums for traveling shows. The museum has evolved from exhibition space to theatrical or performance space.[4] The renovation and expansion of the High Museum provides an example. The Renzo Piano addition, which involved the creation of a piazza joining the museum's multiple buildings, also added a large 'empty' exhibition building that was inaugurated by the Louvre-Atlanta exhibit.[5]

Stafford's primary intention was not to draw attention to the Disneyfication of art museums. Her questions were not directed toward the museum as such but toward the discipline of art history. What can cognitive research tell us about the ways the 10% of conscious activity that remains present in a museum visit could be engaged by curators?

> Something of the complexity, as well as the perplexity, aroused by multiplying media ambients is encapsulated in the paradoxical perception that today's museums, especially art museums, are successful despite their failure to communicate. The museum is a good place to begin my reflections because, unfortunately, the public understanding of art as an aesthetic entertainment with leisure value is a perception shared by many scientists.

For Stafford, communication is impeded by the optical prejudice or fallacy that occupies art history and the ways that the study of visualization is nested in logocentric arguments. Her research agenda was stated forcefully in an article from 1994:

> I believe, then, as imagists it is time we look to another quarter (the structure and activity of visual cognition itself) both for our praxis and our methods. We must frame a unified theory of imaging from the intersections of the old historical arts with the new optical technologies. True interdisciplinarity would be grounded in the acknowledgement that perception (*aisthesis*) is a significant form of knowledge (*episteme*), perhaps even the constitutive form. It is also time to assert that innovative collaboration can occur only in a

[4] See Pegah Zamani, *Views across boundaries and groupings across categories: the morphology of display in the galleries of the High Museum of Art 1983-2003*, Georgia Tech PhD Dissertation 2008.

[5] The addition may be compared to the large exhibition spaces constructed for world fairs. It is noteworthy that some of these became architecturally significant as structures integrating steel and glass.

> community of intellectual equals. Moreover, creating such a hybrid or composite art-science of visualization would hope to avert a broader social and cultural danger. It offers the model for a concept of learning that challenges our remaining unskilled and naïve ingesters of misinformation we did not help to produce.[6]

A new conceptual vocabulary shaped in part through cognitive science is required to engage visualization, if the new digital technologies are to become more than a vehicle for the proliferation of images. There are precedents. Panofsky's 'synthetic intuition', Gombrich's work on developmental psychology or Cassirer's on symbolic form offer historical examples of art history's engagement with what today would be termed cognition.[7]

Stafford is interested in promoting a new transdisciplinary museum: [8]

> I began with the case of the transdisciplinary multimedia museum—operating at the intersection of engineering, robotics, physical, biological, and computer sciences, digital technologies, myriads arts including performance, and unconventional architecture as well as innovative exhibitions spaces—because it trains a new kind of sophisticated agent-viewer. Defying our most deeply rooted mental habits and fixed categories, such shifting environments fundamentally question the stability and persistence of the individual object as well as the self-contained subject. Such novel milieus set the stage for a larger psychophysiological transformation. They have the potential to model for the media-savy and media-saturated onlooker how to become an intelligent participant, actively co-creating one's surroundings. As is a true in real-life situations, a sociable art that breaks isolating modes of reception is something more than a spectator, or single-connoisseur sport. 6.

Her response to Louvre Atlanta and to the question of heritage must be a warning that heritage is not the domain of an optically driven art history but should be opened to include a broader field of sensual experience. The conjunction of old optical practices or prejudices and digital media risks furthering the transformation of the museum experience into little more than the promiscuous exchange of images. The potential social experience of the museum will be increasingly fragmented into isolated individuals smothered with headgear. How can the social experience of art be reinforced as a means of affirming a common purpose?

4.2 Digital interventions.

How then can digital intervention expand experience in the museum? Using her own digital interventions in permanent collections as a point of departure, the British artist Jane Prophet made it clear that there is, for the digital artist, a fundamental question as to whether intervention is worthwhile at all.[9] Are digital artists not already contributing to entirely

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[6] Barbara Stafford, 'Presuming images and consuming words: the visualization of knowledge from the Enlightenment to post-modernism,' *Consumption and the World of Goods* ed. John Brewer and Roy Porter (London: Routledge, 1994), 462-477; 473.

[7] Stafford extends a logical-cognitive question raised by Langer and developed by Badiou and others. How can experience in the museum be regarded as a complex of logical acts?

[8] Stafford's High lecture took up questions she has been asking in her books. *Echo Objects* (2009) interrogates the cognitive work of images. *A Field Guide to a New MetaField: Bridge the Humanities-Neurosciences Divide* (2011) includes cross-disciplinary contributions spanning anthropology, architecture, art history, classics, cognitive psychology, musicology, neuroanatomy, religion, geography, urban studies, time-based media, and cultural studies.

[9] Jane Prophet is a British artist living in the US. She has worked with new media for two decades, produing "surprising and beautiful objects" integrating traditional materials. She makes photographic pieces, temporary installations, objects and video. Site-specific light-based installations include *Conductor*, a flooded power station lit with luminescent cables and *Counterbalance,* an outdoor installation in rural Australia made in response to climate change. Many pieces explore of the experience of contemporary landscape. *Decoy* and *The Landscape Room* combine images of real and simulated landscapes. *Model Landscapes* includes miniature trees made from mathematical data. Works-in-progress include a large scale earthwork and a series of planting pieces, such as a meadow and orchard. Jane Prophet has been a key participant in a number of internationally acclaimed projects breaking new ground in art and science. Her collaborations with stem cell researchers, mathematicians and heart surgeons radically re-envisage the human body. In 2005 she won a National Endowment for Science, Technology and the Arts Fellowship to develop interdisciplinary artworks. She is Professor of Art and Interdisciplinary Computing at Goldsmiths, London. http://www.janeprophet.com/

different cultural phenomena through their ambient and evolving presence on the web or through a myriad of mixed media events?

Prophet's own work on landscape demonstrates the importance of intervention in museums and heritage sites as a subtle presence enabling dialog.[10] Using technologies developed by the film industry and the military for simulating environments, she explores ways that fractally generated objects can be used to augment traditional British landscape painting: 'The Landscape Room and Decoy both address the relationship between the represented landscape and the constructed landscape, given the influence of idealised landscape painting on eighteenth century landscape garden design.' (Jane Prophet, *Decoy*, 2001) In her lecture, she goes on to observe:

> If Decoy is about constructed landscapes ordered around aesthetic and wealth-displacing principles, the Blot series of 2003 focuses on constructed landscapes that are the result of industrial considerations….While the two works function in similar ways, the Blot series suggests a step from Decoy. The term 'blot' refers to the phrase 'blot on the landscape', as if these sites are somehow disfiguring the 'natural' landscape but it also refers to the familiar Rorschach blot test used by psychiatrists. This reference suggests that our experience of the views is somehow relative; a certain component of looking involves seeing your own mind. Not only does this provoke us to question our own responses to seeing these landscapes, but it also emphasizes how much of our experience of the environment is based on our own, internal factors. And if—to a certain extent—we see what we want to see, then our senses can be more easily deceived. This is what simulation and representation rely upon.

Digital intervention in an established genre of art history becomes an act of renewal through the continuous comparison of a range of visual iterations of the same subject.

The concerns Prophet had about hanging her work together with original landscape paintings disappeared when she found groups of viewers discussing both the differences between the representations and their own recollections of how local landscapes had changed over time. She was bringing attention to the social renewal of heritage collections. Her work with landscape painting showed how the genres have always touched on 'more than meets the eye.' Landscape painting can be considered as a painterly illusion in which the painter's vision is less an end in itself than an invitation to comparative practice. A landscape may engage a romantic image but also asks what has been augmented or altered in the process. The addition of wire trees thus becomes reminiscent of the ways that earlier landscapes were altered.

Digital augmentation permits awareness that the so-called original itself may be viewed as a continuum. The well-worn question of aura is relevant here. Discussions of digital media and of heritage are pushed apart by an approach to aura restricted to the distinction between 'original' and 'reproduction'. This can only lead to a defense of the integrity of art history or a challenge to develop arguments for the specificity of new media. However, for Benjamin, aura was not a positivistic determination: it was a matter of memory. Prophet's work offers an invitation for a consideration of aura in terms of shared memory.

When the virtual becomes viewed in opposition to the tangible object in the museum, the perceived ephemeral quality of digital representation may be related to aura. The virtual existence of wire trees in Prophet's work reminds us of the ways our regimes of experience are being expanded by digital technology. Even more, a consideration of the virtual requires us not simply to develop a new ontology of matter but to look seriously at the ways these questions are embedded within the rich discussion of mathematical objects. Prophet's fractal generated trees remind us of the geometric codes inherent in all structure. Digital intervention in the museum broadens the spectrum of experience.[11] It reminds us of the distinction between the learned and experimental regimens of copying in art school education.

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[10] Cited in Jane Prophet, (San Paulo: Paco das Artes, 2006), n. p.

[11] A new ontology of the digital in many ways challenges a reconsideration of the 'old' ontology of the mathematical object and must also be part of the laboratory of the museum.

Prophet's richly suggestive intervention demonstrated the limited ways in which digital media was engaged in Louvre-Atlanta. On leaving the lecture hall, one was 'welcomed' by digital audio guides and the digital infrastructure that monitors the museum. When the prospect of greater digital intervention was raised with curators, we were told that the Louvre had contracted a Japanese firm to do digital work whose sophistication would permit remarkable revelations on the layered physical structure of paintings. While such application of digital technology has its purposes, it also reveals a limited view of digital technology as a means of enhancing 'art' through science–that is, as a vehicle for reinforcing the stature of art history and the authority of the museum. Prophet's commentary resonates strongly with Stafford's challenge that if the museum is to have a future, it needs to move beyond a restrictive view of history and a narrow view of science.

4.3 The demise of the Enlightenment museum?

Surely any formal relation between the Louvre and an American museum such as the High requires us to pay attention to fundamental ideological differences. As a state museum professing an Enlightenment vision of freedom and education, the Louvre enjoys unquestioned authority. Yet, when compared with American museums, this perceived authority can be called into question. Both claim a heritage grounded in the Enlightenment. However, this is expressed in significantly different ways. In contrast to ordering collections that would explain art to the world, American museums have adapted ideas of freedom and education in settings that give expression to more pragmatic democratic ideals. They have functioned as departure points for exploration that extends beyond art history. Frequent passages in the novels of Henry James show the museum as testing ground for psycho-social identity (the opening paragraphs of *The American* read as a vignette of a Louvre experience that is a satire of both the museum and the American visitor). Perhaps more significant for our purposes is the fact that, rather than being an end in itself, taxonomy in American museums serves as provisional point of departure. Thus, the collections of the Barnes Foundation (which have recently moved to Philadelphia) were organized by the foundation's creator for the benefit of his employees and the socially and culturally deprived students at Abraham Lincoln University. The Barnes does not hang its collections in the manner of a guided art-history tour. It juxtaposes paintings and other artifacts so as to enable the emergence of sensation–of percept and affect.

Abrioux's intervention challenged the audience to turn upside-down the unquestioned authority given to the Louvre. In a separate lecture given to the curatorial staff of the High Museum in the months prior to the opening of the exhibition, he reviewed the curriculum of the École du Louvre to demonstrate how art history had become regimented to the extent that the experience of art was marginalized in favor of refined categorization. This being so, it might be more appropriate to ask what the American museum – where sensibility is less dominated by the Enlightenment cult of reason – has to offer the French museum. Unfortunately, the Louvre-Atlanta exhibitions hardly served to work in the gap between French and American museums. They testified rather to an expanding network of world museums figuring out mutually beneficial marketing strategies.

If sensibility is even raised, it becomes part of the regulatory apparatus of museum infrastructure. We have already suggested how cognitive models of behavior inform museum architecture. Today, a visit to the museum is also associated with security checks, dramatic stories about daring thefts, and visual surveillance. Experience of the art is also accompanied by controls that reinforce the taxonomy of art history. Its social function has become a component of the surveillance of society itself. As much research has shown, the art of the museum has become bait to attract a public viewed as a source of income. Art is reduced to image; images function as trophies or advertisements: 'I have seen this,' 'I want to remember'

murmurs a postcard of a Poussin painting. Where, in this social ritual, is an experience of painting?

The U.S. strategy for bombing Bagdad in 2004 was baptized 'shock and awe'. This probably unconscious borrowing from Burke's idiom of the sublime reveals much about the shift of attention from the image in the museum to the image on television. The former is less and less a vehicle for experiencing awe. Too often, it is restricted to a place to review a history devoid of the shock of art. Perhaps it serves as a vehicle for preparing the public for shock at the same time that it reinforces a sense that we are fully capable of absorbing whatever happens. Attention is drawn, not to the experience of art, but rather to the experience of the museum as a device for socio-cultural integration.

Consciously or not, the Louvre-Atlanta exhibitions celebrated the hegemonic presence of the Louvre. However, they may also be viewed as a sign of awareness that the Louvre's presence no longer constitutes a revolutionary force but rather one of maintenance. Multiple interventions, including in the form of studio prototypes, are essential if we are truly to contribute to more than the maintenance of the museum. Digital interventions may provide an opportunity to once again assert a consideration of sensibility, amplified beyond an eighteenth century setting but also beyond the sphere of techno-scientific efficiency, as a move towards the institution of a truly heterotopic museum.[12] In the closing sections of this presentation, we should like to speculate on the possible significance of the intervention of video games within museum and heritage culture.

5. A serious museum game.

The obvious strategy for exploiting the democratic potential of the bottom-up experimental practices enabled by digital media in the development of a videogame prototype for engaging students and/or the general public in museums, their collections and their exhibitions, doubtless consists in designing what is known as a 'serious' game.[13] We followed this course of action in working with postgraduate students on the game prototype Louvre@Gatech. This was conceived as an interactive installation both on-site and on-line. Its objective was to increase the diversity of the museum-going public by enriching the range of possible interactions with works of art and with the museum as an institution. It invited participants to 'curate their own gallery' by choosing from a selection of digital reproductions of drawings, paintings and other artifacts exhibited in the first *Louvre-Atlanta* exhibition at the High Museum (2006-2007).[14]

As an interactive digital project which explicitly built into its structure a requirement for reflection and argument, Louvre@Gatech situated itself unambiguously as a 'serious game'. The project sought to conceptualize the functions of art museums through one aspect of the responsibilities of curators–the selection of works for hanging in a given museum space or for a temporary exhibition. The idea was to provide participants with a convincing curatorial workspace in which they would be enabled to make interesting decisions. For the game to be realistic and instructive, it needed to foster both reflection on curatorial choices and motivation of curatorial decisions. Its parameters were to be set in such a way as to promote group curatorial practices. Louvre@Gatech did not aim at providing an indeterminate set of individuals with the possibility of enjoying the solitary pleasure of virtual curation. It sought

[12] This is more than an issue of the technological foundation of *contemporary* civilization: civilization as such cannot be separated from technology.

[13] For an analysis of the potential for critical reflection in digital games, see Ian Bogost, *Unit Operations. An Approach to Videogame Criticism*, The MIT Press, Cambrido, MA 2006.

[14] For a more detailed account of Louvre@Gatech, see Yves Abrioux, « From Instrument to Medium: Engaging the Museum through Digital Technology. Towards a Virtual-Curation Game », Alice Autelitano (ed.), *The Cinematic Experience. Film, Contemporary Art, Museum*, 212-222.

to stimulate collective curation in a virtual environment as a means for a shared exploration of works of art.

Initially, the social dimension of the game was to be conducted *in praesentia*, the game being structured so as to invite a group of participants, either on-site or on-line, to jointly select a limited series of artworks and artifacts for temporary display. However, it is important not to forget that an essential dimension of the shared experience of artworks takes place *in absentia*. Works of art do not exist in a neutral space where they might be categorized in objective terms. They are inscribed within an on-going tradition in which each and every instance of appreciation or interpretation is influenced by a non-totalizable network of artifacts and acts of interpretation and/or display. Each and every individual approach to a work of art contributes to this developing network, in however fleeting and modest a manner. Accordingly, one of the longer-term ambitions of the Louvre@Gatech project was to facilitate and map the emergence of traditions of appreciation and interpretation from bottom up, in a highly decentered and disseminated approach to visual art. In time, increasing numbers of artworks and participants would have accrued through an open collaborative process. The principle was that a meaningful game-based curatorial project should aim at developing interactive processes based on the peculiarly seductive authority invested in works of art (which come to us from the past, however recent), so as to enable a species of social interaction (in the present) that would provoke the emergence of an open process of shared interpretation (and so model the future). Beyond the important question of democratic access to art and museums, this ambition implied an experiment in democratic community-building through art.

The objectives thus formulated implied a set of features enabling a simulation of curatorial activity within the terms of the proposed game. Defining simulated curatorship as a set of possible moves within this game, these features were to offer participants a palette of necessary and/or optional activities. In its most elementary form, this "curator's palette" was to address the process of selecting and displaying images in a way that stimulated interaction between participants. It was furthermore planned to take into account the material and virtual sites at which the game might dispose of "gallery" space. It also had to incorporate a simple memory system. Finally, the game needed to address the balance between visual and verbal displays, in such a way as to insist on the stimulation of visual rather than verbal culture as a significant feature of the activities it proposed.

To this end, the curatorial game project sought to instantiate in a meaningful manner the recognized strength of electronic media in providing enticing interactive spaces, where players can engage with materials that have been digitalized and stored in a way that makes it possible to tie playing to learning. By exploiting the known capacities of electronic media for storing visual materials in readily accessible form, it would also participate in redressing the bias towards verbal culture which has traditionally marked formal education. The game would also stimulate direct social exchange. Players would not interact by means of avatars acting within a field of pre-scripted possibilities. On the contrary, the game would actively foster conversations on-site or on-line.

By engaging with the capacity of electronic media for instantiations of images on different scales, in multiple sites with diverse material features, the curatorial game sought to address a specific issue in visual culture–and one which is closely related to the institution of the museum or gallery. No work of art–paintings, drawings, prints, etc. included–is merely an image. It is an object with its own material qualities of substance and scale, perhaps including an original physical connection with a specific site from which it may have been torn in order to enter the museum, sometimes being materially altered in the process. Neither these physical features nor this history are visible when the reproduction of a work of art is displayed on an electronic screen (or indeed in a standard catalogue). A virtual-curation game should actively

raise the issue of the materiality of (images of) works of art and their perception. Our project aimed at doing so by conceptualizing its on-site game areas as exhibition spaces specified by their architectural features, by the electronic media which were already present (or could be installed) and by their institutional status.

An enhanced curatorial game might usefully incorporate a number of additional features. Without compromising the emphasis on visual culture, supplementary possibilities might be proposed for recording verbal responses to individual artworks or juxtapositions of works.[15] A technically enhanced capacity for the complex sequencing, superimposing, merging, etc. of images might usefully be accompanied by a database familiarizing players with the sophisticated poetics of image montage. Recourse to videogame technology would enrich the virtual gallery spaces made available to participants. In time, players would be able to "install" or "hang" a potentially indefinite number of artworks and artifacts in simulations of historical galleries and monuments. The nature and number of existing or imaginary spaces for displaying images of works of art would also be increased, through simulations of places not traditionally associated with displays of art. This option would imbue the digital exhibitions produced in the curatorial game with something of the allure with which the current wave of high-profile architectural projects seeks to endow newly-built museums and museum extensions. The development of some such dimension in the curatorial game would imply making available to players significant elements in the history both of collections and of the hanging practices to which they have been subjected. The virtual exhibition spaces proposed to participants would thus include early museums, which have since disappeared, and/or specific moments in the history of existing museums.

Most significantly, the curatorial game would require the development of a memory system that included an emergent canon-formation function. In so far as canon-formation takes place within a tradition, it is not a matter of statistical prevalence but of an enduring authority whose emergence is path-specific. In this sense, canon-formation and tradition-building are truly historical phenomena tied to a community of interpreters. By building a system capable of registering the impact of individual acts of curation on a path-determined memory, rather than a purely statistical one, it would become possible to enable a process of disseminated and collaborative tradition-building and canon-formation. This would constitute an innovative use of digital technology as a democratic social medium operating in an open environment, as opposed to its use as an instrument placed in the hands of a community conceived as an indefinite number of atomistic individuals[16]. We shall propose in conclusion two possible, and indeed related, lines of research which we believe to be promising.

6. Digital capacities in an augmented museum.

For reasons alluded to above, we were unable to pursue development of a virtual-curation game in collaboration with the High and the Louvre. The project remains in limbo. Moreover, the game has obvious limitations as an avenue for engaging a digitally-born public with museums and heritage. These stem from its continued insertion in a mainstream conception of enlightened pedagogy. A clear symptom of the video-game player's resistance to this was provided by the way even graduate students saw the enablement offered by a primitive prototype of Louvre@Gatech essentially as a means of participating on their own terms in what they perceived as a privilege institutionally the domain of professionals whose very

[15] It would be advisable to constrain the length of responses, perhaps by limiting them to a text displayable on a single screen and/or by requiring that they be composed and submitted within a limited time frame, etc.

[16] "Visual Thesaurus" software comprises an interface which suggests a way of enabling interaction with a decentered evolving memory including path-specific features that go beyond the more elementary powers of statistical analysis.

existence typically goes unnoticed by visitors to museums. In a manifestation of individualism that tended to deny not only the significance of curatorial expertise but also any real sense of responsibility towards a potential audience, students tended to anticipate the joys of displaying the fruits of their imagination, both 'artistic' and personal, on a variety of screens, preferably very public and on a very large scale. Combating this tendency, as we did, by appealing to a sense of responsibility and initiating discussions of the constraints that would have to be integrated into the game's platform to enforce this, was tantamount to instituting from top down a criterion of enlightened control that went against the grain of the first-person enjoyment of power that typifies game culture in virtual environments. A more promising avenue might involve harnessing the increasingly open range of behaviors enabled by video-game culture.

Successful interactive digital video environments are characterized by their smoothness. The ensuing experiential persuasiveness could undoubtedly provide a spectacular intensification of standard hands-on pedagogical activities. Beyond that, however, it is necessary to recognize that the fluidity of the medium is a function of its responsiveness–and furthermore that this allows the spectator's interaction with the virtual environment to escape from the space of possibilities dictated by narrative role-playing. A responsive medium enables a convincing exploration of its simulated spaces. Not only does this turn videogames into so many variations on quest romances. It invites plays that substitute for strict game-playing the vicarious joys of exploration, including serendipitous exploitations of functional objects within the environment, against the grain of their overt function, or again a search for glitches in the program code that may, for example, provoke transformative collapses in the game's functionalities. Interestingly, game theorists argue that such 'meta'-behaviors are anything but exceptional: testing a game's responsiveness is standard practice for experienced gamers.[17]

Properly speaking, such responsiveness implies not space but place–not the potentially infinite extension of an empty framework within which actions may unfold but a confrontation with the cosmological principle of a world that is by some measure alive: that acts and may be acted upon, as if gamers become responsive to a diffuse intentionality. Let us call this *authorship*, so as to underline a connection between videogames and art as such. It will require intensive experimentation to find out just how far the responsive "space" of interactive video may be made to resonate with the responsiveness, not only of the spectator, but of the work of art itself.

An additional twist is doubtless required for tradition and canonicity to be absorbed into the play. The tradition-building or canon-formation constraints imagined above for Louvre@Gatech–but which, no doubt wisely, we did not attempt to model–took stock of the fact that any act of interpretation or curation cannot be considered solely in terms of individual cognition or sensibility. A tradition or a canon does not exist simply in individual minds; it gives interpretation a concrete dimension. As a collective historical phenomenon, canon-formation is distributed across a network of institutions (curatorial, educational and research), media environments and creative acts. It materially changes the status of the entities it affects. By giving players a hands-on role in the dynamics of canon-formation, the more sophisticated version of our projected game would have had the effect of ontologizing cultural mediation. Simultaneously, it would have moved it away from the essentially top-down pedagogical logic dominant in the field, which our initial virtual-curation game did not fundamentally challenge, since–despite the opportunity it sought to provide for a broader understanding of curatorial power–it in no way sought to change the sociocultural rules of the museum as institution. The question is whether innovations in digital media may not put them

[17] For a discussion of these issues, see Michael Nitsche, *Video Game Spaces*, Cambridge, Mass.: MIT Press, 2008.

in a position to act in this way and thereby contribute to the invention of a museum yet to come (*à venir*), in the wake of the exhaustion of the Enlightenment museum.

Louvre@Gatech, the name we gave our sketchy curatorial game, was perhaps inadvertently apt. Wherever it might be hosted (on- or off-site, or on a personal computer), however it might be played (*in presentia* or on-line), it would remain disjoint from the exhibition venue proper. Institutionally and technologically housed at Georgia Tech, it was conceived to be played in parallel to the museum exhibition at the High. It is debatable whether, in such an environment, even a sophisticated constrained canon-building memory (were this indeed to prove possible to model) would prove capable of producing telling results. When modern and contemporary artists have harnessed the museum to creative acts, this has invariably involved a dimension of institutional critique absent from the logic of Louvre@Gatech. We suggest that augmented, rather than virtual, environments could prove more able to transformatively engage museum visitorswith institutional constraints, even implicitly, as an alternative to playful instruction. Accordingly, we shall conclude on a speculative note, by suggesting how digitally augmented environments might contribute to defining what we refer to as the future of the museum (that is, to the invention of *un musée à venir*) through the design of truly responsive interfaces, in contradistinction to the current concern with *antennes*, whether with local (pedagogical) or global (pecuniary) outreach.

A prime candidate for experimentation in this direction are machinima environments, which allow real-time display of digitally generated and/or treated images (and sounds). The effect is to transform cinema into a performative medium–a prospect all the more enticing for the experimental interpretation of artworks through manipulation, in that the skills required are multilayered, involving 'abstract' coding for the production of visual surface effects. Furthermore, by using tangible user interfaces (TUIs), machinima also enables hands-on interventions by spectators.[18] In a museum environment, the interaction of the machine-cinematographic skills of digital artists with image transformations manually effectuated by spectators would allow for the emergence of a sensation- rather than discourse-based process of material, recordable collaborative interpretative performance. This might be expected to multiply significantly the effects of micro-perceptions and micro-gestures ordinarily restricted to the pervasive domain of non-conscious activity evoked above. Archived and projected as digital video, interpretative performances might give rise to a new artform capable of stimulating the development of a tradition of performative coding and gestural routines.

We are only just beginning to engage with videogames and machinima as media for transformative engagement with artworks and comparable artifacts.[19] Consequently, our only certainty today is that it is time for the antenna or relay station, which will always be subservient to the center whose power it extends, to give way to interfaces that are responsive in an extended sense and involve all interested parties in the kind of creative experience that museums of the future may be hoped to foster.

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[18] For a comprehensive overview of machinima, see Henry Lowood and Michael Nitsche (eds.), *The Machinima Reader*, Cambridge, Mass.: MIT Press, 2011.

[19] In collaboration with Ali Mazalek and Michael Nitsche.