Pixel vs Pigment

The goal of Virtual Reality in Archaeology

Laia Pujol-Tost, PhD

upf. Universitat Pompeu Fabra Barcelona

Archaeology has a long tradition of visual depictions of the past. Initially done by hand and based on artistic skills and conventions , "paintings" were later "replaced" in the general context of Archaeology by 3D digital models. Yet, it is interesting to note that while hand-drawn depictions tend to show human figures and seem to be associated with scenes of "daily life", virtual reconstructions tend to show architectural remains, usually "empty" of people and sometimes even of objects. But still authors state the intended goal is to show the past and aim for maximum feeling of Presence. This is I wondered why VR applications in Archaeology are (still) empty, especially in comparison with hand-made depictions.

2005: "Immaginare Roma Antica" Exhibition (Rome)

2006: Ename Museum (Belgium)

2007: Foundation of Hellenic World (Athens)

Lets put on the table some evidence. From the bibliography of the last two decades and the results of three previous studies conducted by myself in Rome, Ename and Athens, my conclusion was that both audiences and experts perceived VR as allowing infinite perspectives (navigation) and as closer to reality, as more objective. The reasons? 1) It reproduces 3D spaces, has metrics (and now it is not modelled anymore, but directly scanned from reality). In this context, including human figures seemed more speculative. 2) Technical issues: the number of polygons that the processor can handle in real team interaction. 3) The "uncanny valley" effect in the modelling of humans. For these reasons, both audiences and experts considered illustrations were better for wide dissemination publications, specially for children, who need more explanation than scientific accuracy. Finally, they also associated their production with a different kind of professionals (illustrators and people involved in "public archaeology").

3

Let me tell you now about a very recent study, conducted in the framework of the LEAP project. LEAP is a two year project funded by a Marie Curie Fellowship that aims at building a theoretical and methodological framework for VR mediated experiences, based on the adaptation of the HCI concept of Cultural Presence. Last month I conducted fieldwork at the Neolithic site of Çatalhöyük (Turkey) to gather input from different specialists in order to refine the concept of Cultural Presence. I used a combination of "subjective" and "objective" approaches. In the first case, the experts were asked in a questionnaire about the defining elements of Çatalhöyük as a culture and about the best ways to depict it. [CLICK] In the second case, the experts were recorded while they described what life at Çatalhöyük was like 9000 years ago, in three different situations: at the site, at a reconstructed house, and by means of two illustrations.
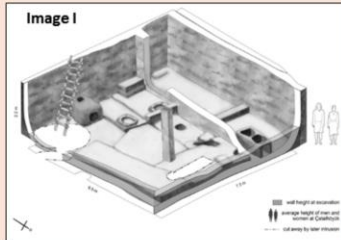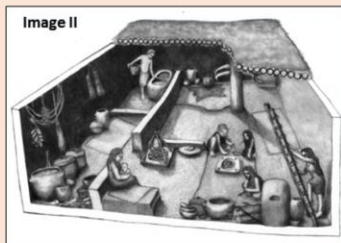
What did I learn about illustrations and virtual reconstructions? [] With Image II participants talked immediately about people and activities. And they declared in the questionnaires that it helped them focus more on people. [] With Image I several of them felt uncomfortable because it was empty and difficult to read, [] although it provided archaeological evidence. The main problems with Image II were that: it missed the dynamism and changes in time; the point of view cannot be changed; [] and that there was too much interpretation. The last two match the conclusions of the previous studies.
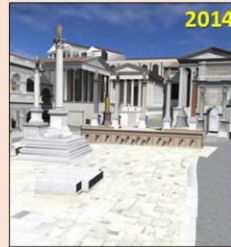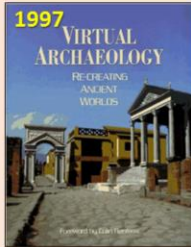
Image I
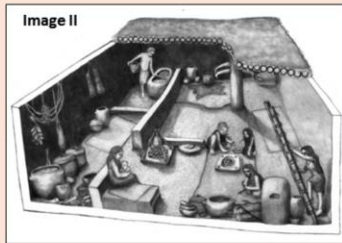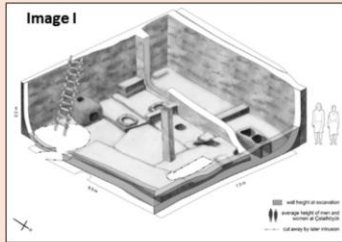
Imagine VR	Count
Representation of life (dynamism, activities, events)	4
Distinction betwen remains / reconstruction	3
Realistic navigation (roofs, eye's view)	2
Representation of objects, including organic	2
Representation of temporal evolution	2
Non-standardization of world	1
Interactivity	1
Adopt unusual perspectives	1

Image II

Similar to	Count
Site - Because it contains basic information	3
House - because immersive and multisensorial interpretation	2
All of them - because different medium allows different affordances	2
Image2 - because it shows life	1
None of them - to avoid repeating same limitations	1

But, when asked about how should a reconstruction of ÇH, they declared that it should show life and objects (like Image II but in a dynamic way); that it should distinguish between evidence and reconstruction (like the site); be immersive and multisensory (like the reconstructed house); that navigation should be natural (at eye's, not bird's view); and that it should show temporal evolution and different points of view (not meaning navigation).

As you can see there is a contradiction between these expectations and final products that are the same [] twenty years ago and now. On the other hand, two international declarations were established recently, [] the London Charter and the Sevilla Principles, several of the points of which [] are clearly not followed! And we could argue against the traditional arguments of objectivity [western world perception/depiction + people being more hypothetical than house roof] and technological limitations [realism in games, empty videos and images]. So maybe the problem is Archaeology itself: its goal and scientific entity. We come from a tradition of retrieval, description, and visualization. On the other hand, unlike in the physical sciences where the new paradigm replaces the old one, in Archaeology there is a lack of epistemological consensus, there are different ways of understanding and doing archaeology. In my opinion these two elements have helped that the new interdisciplinary area of Virtual Archaeology integrates very easily [CLICK] the goals and interests of the Computer Graphics field (data capture, visual realism), reinforcing our notions of plausibility and pure description through visualization of artefacts and sites.

So in the end my question is not why are virtual reconstructions empty, but if we want to change that and how? Building a 3D model takes time and requires skills, for a result in the end not much different than illustrations, since we are clearly underusing VR's capacities. We are spending time and money for results that neither are ethically correct, nor accomplish their goal since from the few evaluations conducted we know that people aren't learning anything about the past and from other studies in C&E we know that realism can even be counterproductive. So my question is: how do we do our job, our passion, against hype, inertia, and economic interests?

Universitat Pompeu Fabra Barcelona

Pixel vs Pigment

The goal of Virtual Reality in Archaeology

Laia Pujol-Tost, PhD

Laia.Pujol@upf.edu   www.upf.edu/leap