The Virtual Pompeii Project

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Abstract: A virtual reality reconstruction of the Theater District in the Roman city of Pompeii is now available at no cost for all uses in art and education, at "http://artscool.cfa.cmu.edu/~hemef/pompeii/". It includes supporting materials, such as a written introduction to the history of the area, a library of scanned images, and original musical and dramatic compositions. The original materials were produced for the "Pompeii Project" at Carnegie Mellon's Studio for Creative Inquiry in 1995/96. Silicon Graphics and other donors sponsored the project which showed at the DeYoung Museum in 1995. Educators may use these materials for direct instruction in Roman art, architecture and culture (show-and-tell learning design), as a resource for student projects (constructionist), as an electronic meeting place in an educational online shared community (constructivist), for a learning game or for applications in Museum education.

Introduction

The 1995 "Virtual Pompeii" project at the Studio for Creative Inquiry at Carnegie Mellon reconstructed (in virtual space) the theater district of the ancient Roman city of Pompeii. This included three dimensional models of the Temple of Isis, the Grand Theater, the Triangular Forum and connecting areas. The project also produced supporting historical documentation, original musical and dramatic compositions, and source imagery. It employed the new Immersive Virtual Reality medium to produce an interactive historical recreation. Funded by Silicon Graphics and a many other sponsors (Pompeii 2005b) the project was a unique attempt to employ the full expressive power of the (then) new Immersive Virtual Reality technologies to recreate part of the ancient past. It gained some notoriety (Brigman 1996; CSA 1995; Frischer 2001; Malloy 2001; Roehl 1997; Tebben 1995; Youngblut 1998), especially with a show (ofthe static models, only) at the DeYoung Museum in 1995.

Figure One: Inside the virtual Temple of Isis

Now, the entire output of the Virtual Pompeii project is available to the public, via the web, for educational and artistic uses (Pompeii 1995b). Today, a standard home computer and off-the-shelf authoring software are more than adequate for educators to make their own VR-like learning applications. The materials provided can be used in a wide range of instructional designs as we will discuss, later. First, however, we will describe the Theater District and why we chose to use it for this project.

Content

On August 24, A.D. 79, the Roman city of Pompeii and its inhabitants were engulfed by a cloud of volcanic ash from the eruption of nearby Mount Vesuvius. The city lay buried and forgotten until it was found by accident in the mid 1700s, and has fascinated us ever since. Not only has Pompeii added immeasurably to our understanding of the art and society of the early Roman Empire, but its art and its story have been an inspiration to countless writers, musicians, and visual artists.

The Pompeii Project centered on a virtual reconstruction of Pompeii's "Theater District." This area was chosen because it is extensively documented and it housed a variety of activities (religious, commercial and entertainment), providing useful cross section of Roman urban life. The district contained three important monuments: the Grand Theater, the Temple of Isis, and the Triangular Forum.

The Grand Theater had an ornate stage and horseshoe-shaped seating which could hold an audience of 5,000 people. Theater was very popular with the inhabitants of Pompeii who loved its color, spectacle, and melodrama. The stage was so popular that repair of the large theater was financed by politicians seeking public office. The theater was probably around 300 years old at the time of the eruption and had been renovated at least four times.

The Temple of Isis was the center of worship for the Egyptian goddess Isis. Worshipers venerated her as a loving mother goddess who promoted fertility, oversaw the changing of the seasons, and healing the sick. The numerous temples of Isis, located throughout the Roman Empire were the sites of elaborate daily and annual rituals and processions. They were administered by an educated priesthood skilled in music and medicine. Isis worship was especially popular with women and with the new elite who gained wealth and prominence as the Roman empire expanded.

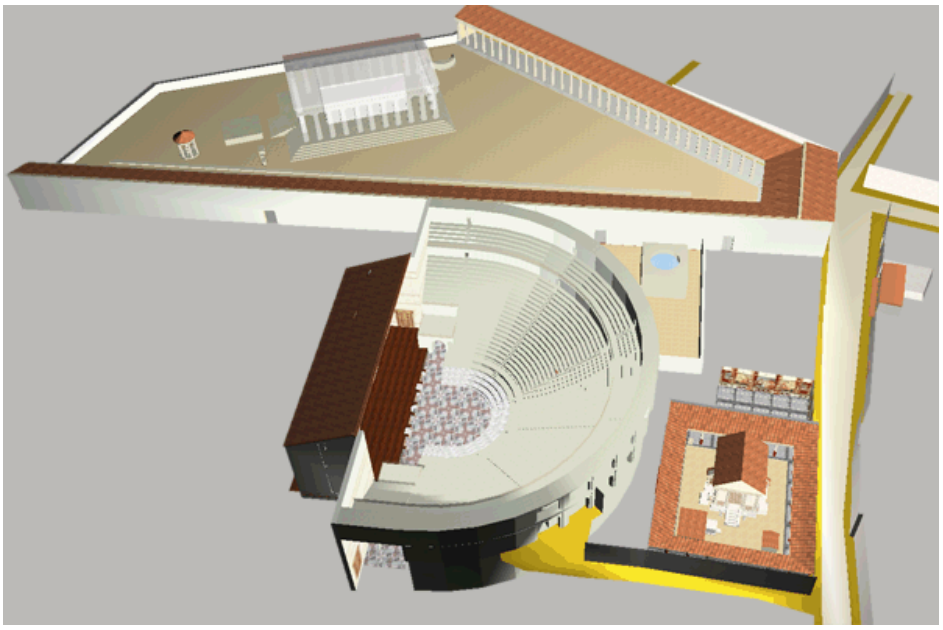

Figure Two: Overhead view of the virtual Theater District.

The third major area, the Triangular Forum was a large public space overlooking the Bay of Naples. It contained the ruins of a temple of Hercules. A wide range of activity took place there, including commerce during market days and performances by mimes, musicians and storytellers. It was a social space where people gathered to gossip and where children played. In general, it was a place for the relaxed public socializing characteristic of Roman urban civilization of the time.

The three major monuments were connected by a narrow street lined with small shops and private homes. It was paved with large blocks of lava and had raised sidewalks on either side. Stepping stones at the street corners allowed pedestrians to cross the street without getting their clothes dirty. Gaps left between these stepping stones let the wheels of carts pass through A public water fountain was in the street in front of the entrance to the Triangular Forum, one of many similar fountains throughout the city. It not only served as a utility, but was an important gathering place as well.

While the simulated architecture most closely represents the appearance of the area in AD79 (just before the eruption) it also reflects other time periods. For example, the Doric temple on the Triangular Forum was built in the sixth century B.C., and the Temple of Isis, was completed just a few years before the city's destruction. The Venice Charter of 2004 (VeniceCharter 2004) for the conservation and restoration of historical sites encourages this approach.

The Theater District is one of the most extensively documented areas of Pompeii, which provides a good range of reference materials for further study. The places portrayed in this project can be an excellent starting point for understanding the roots of modern Western culture, ancient Rome, and even Egyptian history, though the temple of Isis. Some practical examples: Students could research what the cult of Isis was and how this Egyptian religion was modified to fit the Roman context. They could find out about how Roman Theater differed from modern theater, and could enact Roman plays or write some of their own. They can write or create “Roman-like” murals or graffiti or conduct a “Roman” election campaign such as was going on in Pompeii at the time of the eruption.

Now Available to the Public

Nearly everything produced by the project is now available to the public via the web, free of cost for artistic and educational projects (Pompeii 2005b). Recently, Veronica Polo rebuilt most of the 3D models and made some important improvements to the Temple of Isis. The site also contains the original SIG/Irix format models many other important resources. These include a written introduction to the to the Theater District and its historical significance, original sound compositions (chanting in the temple, roman music, snatches of conversation and ambient noises), recorded dialog for a short play, scripts for more plays and a large collection of scanned images of roman artwork and ruins. All items can be downloaded as individual files or in comprehensive packages.

We encourage educators, developer and students student to develop educational applications based wholly or in part on these materials. Today, a typical home desktop computer with a video game graphics card and appropriate speakers is roughly equivalent to the Onyx mainframe used in the original project. To view this version of the theater district, you will need to install a VRML plug-in to your web browser. We recommend Octagon (Octagon 2005) for all platforms, but other browsers are available (Cortona 2005, BlaxxunContact 2005, Cosmo 2005).

It is possible not just to see these materials, but also to alter and enhance them. Virtual Pompeii is written in VRML a simple language that is widely used in educational websites containing simulations of ancient architecture. Despite its lack of features, VRML remains popular because it is simple, easy to use, widespread, effectively public domain and well supported by a large following of dedicated users**.** Authoring with the Pompeii models requires moderate knowledge of the web, 3D authoring tools and general computer literacy.

Many Internet/web delivery technologies exist that are technically superior to VRML (W3C 2005; Web3D 2005), and their tools generally allow the author to import models from VRML and convert them into their preferred format. More advanced skills and tools (3dsMaxx 2005, Maya 2005) or direct programming allow the developer can make animations in the model, such as fountains, fires (such as on the altar in the Temple of Isis) and even virtual people.

In The Classroom

Learning designs with this type of media generally fall into three categories:

1. **Show-and-Tell:** The educator uses the model to illustrate what the monument looked liked to support discussion. This allows the observer to see the complete structure of the object it represents, with all of its features in place. Architects and archaeologists have always built physical scale models for this reason. While such models are robust and easily understood, they can be awkward and expensive and can only be in one place at a time. Virtual reconstructions can be infinitely duplicated and distributed on inexpensive media. In addition, the student and/or whole class can experience a complex model from the inside. The addition of an inside-out view is very important and useful for learners in a variety of topics with a spatial component. See Salzman (1999) for an example.
2. **Constructionist Projects:** The educator can have the students build 3D models so they can learn what the represented objects (real or imagined) looks like. This requires the student to process the source materials intensely, collaborate effectively with teammates, and provides a sense of accomplishment when the project is complete (Jonassen 2000). In addition, the very act of building a three dimensional model forces the builder to resolve issues that might otherwise be glossed over (Frischer, 2003; Levy, 2004). In the case of Virtual Pompeii, the educator could have students extend the model by adding features, filling it with appropriate objects or even animations. Virtual Romans (3D animations) could reenact various social activities, such as dramas or common transactions. If these virtual people (agents) are sophisticated enough, they could interact with the student in limited but interesting ways. Alternatively, the students could simply use the model for parts to build other Greco-Roman architecture, or use the Pompeii model to make games.
3. **Other Constructivist Activities:** With the right software support, students could use virtual Pompeii as a virtual social space, where students could log-in from remote locations, meet each other as avatars, and interact with each other, educators and/or autonomous agents. Something similar has already been done in the area of history/architecture (Raalte, 2003)(Santos, 2002),

In The Home

The models and other components for Pompeii could be used to make a learning game. Megazina (2002) provides an interesting example of such a game (set in Pompeii) where the protagonist has to search for certain items in the city, interacting with virtual people as s/he goes. (Unfortunately, her game is no longer available and the reference is only fragmentary.) A simpler example would allow the user to select or “click on” features of the architecture which would reveal information about those features. The student could then use that knowledge to answer certain questions to be allowed to explore other areas.

In the Museum

The Pompeii Project was originally intended for use in museum-based education. The simplest application was to use it as a history/technology exhibit, as was done at the DeYoung Museum. Such an exhibit could be enhanced by including physical objects appropriate to the virtual space, audience participation and/or virtual people “in” the virtual space going about their business (Gauthier 2003) It would also be appropriate for a Kiosk situated in a larger exhibit of similar projects.

Conclusion

Virtual Pompeii is offered to the public as an opportunity to explore how to to employ Immersive VR and desktop 3D media for education.

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