

A STUDY ON COST EFFECTIVE APPROACH OF COMPUTER GRAPHICS INTEGRATION FOR FIELD ARCHAEOLOGICAL PRACTICE

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Introduction

Computers have become an indispensable tool in our day to day life. They have been used for long time in archaeology to unearth the heritage. They can be used for exploration, excavation, Preparation of plans, producing maps, illustrating the artifacts, re producing the mounds, 3D modeling and to present the results of the analyses.

Computer graphics is one important tool to represent and manipulate large quantities of data with a high level of complexity. In archeology we have a large set of data, complex data, that benefits in being represented using the powerful techniques of the computer graphics.

The advances of computer graphics has provide several powerful tools to treat and model the data collecting and recording by the archaeologists helping them in the tasks that they have to perform as an archaeologist. With these powerful tools provided by computer graphics, is now possible to visualize, regenerate and reconstruct an archaeological site and archaeological objects.

This visualization and reconstruction would be very long term and attemptative task if impossible computer graphics usage. The fields of archaeology and heritage, once those areas are related, have benefited from the new possibilities resulting from the introduction of computer graphics in their work. Another advantage of the use of 3D models of archaeological artifacts and places is that: people can see the past constructions, they can see it from various directions instead of only one like in pictures, the

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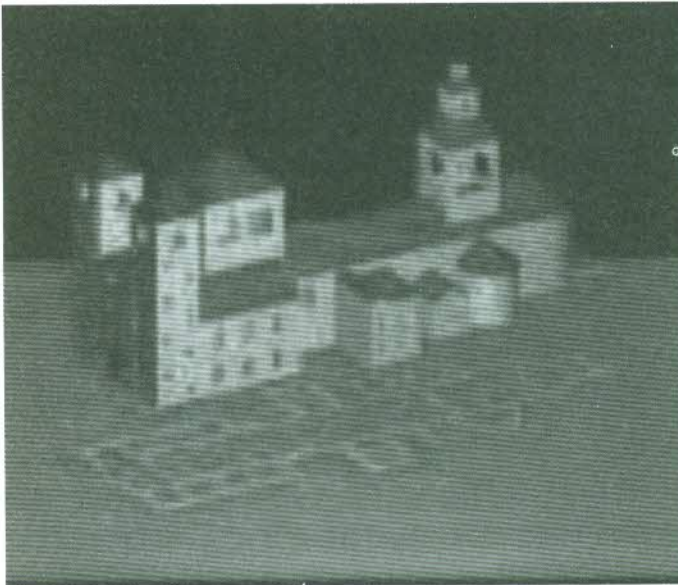
degradation caused by the natural factors and man can be eliminated and finally people can see this through the electric media internet.

Historical Background

Computer graphics are one of oldest branch in Computer Science. Inthe relation between computer graphics and archaeology starts in the end of the 70's. The goal of this relation was to implement an interactive system to assist thearchaeologist in the analysis of the distribution of the artifacts from an excavationsite. The need to use this system to help the archaeologist in the analysis of theartifacts appears by the fact that an archaeological excavation is a destructive process.

The layers that compose an archaeological site can vary from depth and thicknesswhich can lead to a not very correct chronologic interpretation of the artifacts.

Using computer, it is possible to create a virtual reconstruction of the site bycombining a relational database and sophisticated graphics facilities. One example ofthis relation is the Winchester Graphics System (WGS).



Graphics utilization in archaeological projects can be described as follows.

Mapping

Mapping is very important in archaeological field research. We have use maps to identify resources, find locations..etc. Maps are now available as digital backgrounds. These are very effective & can be stored many data. Also we can use maps for analyzing data that collected from archaeological sites. Given below is one of a maps which is being produced by an archaeological excavation conducted by Bhiksu University Of Sri Lanka.



3 D models

In many archaeological sites we cannot find objects as it is. Many of them are broken and some are missing. In such situation, we want to see that these objects are how really it was. In these situation 3 D modeling comes to action. Using 3 D modeling software we can rebuilt most of missing parts of the object and can be seen how it stood in its original condition in the past. Google sketch up is such tool. It is very easy to use and super easy to learn. Given below image shows such development of an archaeological site which was drawn by Google sketch up tool. In using such image we show the past glory very close as in site is.



Virtual Reality and holograms

Virtual Reality is an alternative that was presented to the archaeologists to the excavations and related tasks that have to be performed in an archaeological site. Beside this importance to the archaeologists work it also provides benefits to the education of archaeology and also to the museum presentations without compromise and valuable to be lost. So using these computer graphics techniques it is possible to reveal and study them without putting in any kind of risk of destruction. It also reduces in the time of the work to be done in the excavation site.

Using computer graphics and in particular using virtual reality in archaeology is an important way to allow the archaeologists in their work. It does not only help the archaeologists to visualize the excavation site as it was in the past but helps also to reconstruct and visualize the artifacts. The artifacts recovered using virtual reality can be called virtual artifacts.

Holograms are 3D virtual model. Using laser lights we can show 3D images with various effects. Bamiyan Buddha in Afghanistan was destroyed by religious extremists in Afghanistan. But using these technology archaeologists are able to reconstruct old Buddha statue as it was.



Conclusion

In the last five decades it has been we have face an increasing the number of archaeological researches that uses computer graphic techniques in modern archaeologists in their work. Virtual and augmented reality is used to reconstruct archaeological contexts, to preserve these sites from uncalculated damages and to help the archaeologists in the reconstruction of broken artefacts. But the virtual and augmented reality in the archaeology is not only important to the archaeologists, but it is also important to the visitors of museums and archaeological sites. Using this computer graphics tool they can see and understand the ancient place in a more interactive and animated way. Obtaining a realist image of an archaeological site is very important to the archaeologists, so the illumination of the archaeological sites are become a very important subject in the computer graphics for the archaeology. As a final remark we can see that this relation between these two distinct areas was fruitful.

Keywords : Computer graphics, visualization, 3D Models, virtual reality, archaeology

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