



What can CG/VR computer scientists do for archeologists?

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ARC ARCHEOS closing event
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virtual reality

■ Representation

■ Interaction



■ Representation

The realism ideal, identified with the creation of (photo)realistic representation, has fascinated the CG field since its inception...

to date:

A focus on making images indistinguishable from reality...

photorealistic representation

In the virtual archaeology discourse, two points are brought up as important:

- Validity of information, “authenticity”
- The importance of accuracy in the representation of this information.

Photorealistic depiction has come to be identified with accuracy.

on the other hand...

risk of creating historically accurate yet static worlds that are less flexible for interpretive and/or educational use.

■ Interaction

Exploration / navigation <- to date (walkthroughs)

Reactive to system feedback <- limited and pre-determined

Task / specific action <- even less

■ Interaction

Exploration / navigation <- easy to do

Reactive to system feedback <- difficult irrespective of

Task / specific action representation...

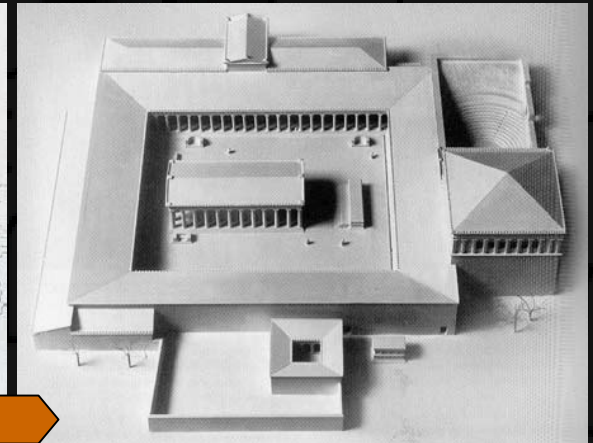
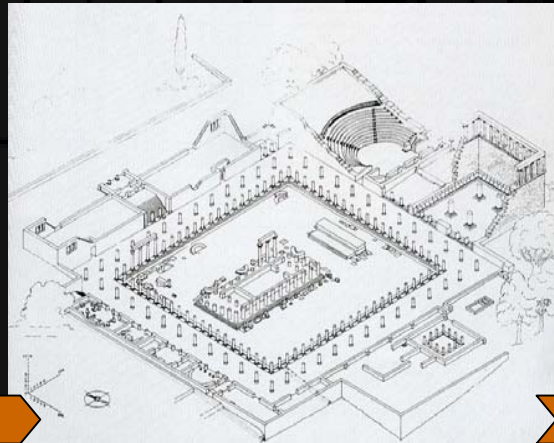
a cultural heritage case study



archaeological site of Messene, Greece

a cultural heritage case study

site to be *partially* reconstructed by the users of the environment who will virtually "build" parts of it in order to explore, make judgements, examine alternative scenarios or experiment with different possibilities.



a cultural heritage case study

«*Constructivist approach*»

simplified, this essentially means:

- Build
- Examine
- Interact
- Manipulate
- Compare



User groups

- Expert user (archeologist, archeology student)
- Novice user (child, general public)

A dark, sketchy illustration of a person and a child in a room. The person is standing in the center, facing right, with their hands raised towards a large cylindrical object. The child is standing to the right, facing left, looking at the person. The room contains several other large cylindrical objects and some smaller rectangular objects. The background is filled with scribbled lines representing trees or foliage. The overall style is a dark, hand-drawn sketch.

what the users want...

expert user (archaeologist): as a research tool

the virtual reconstruction of an element of the monument must be complete (= it should include all preserved architectural members of the monument) and each member should be depicted with the highest possible detail).

- manipulate all available architectural members and position them according to user's own hypothesis
- use a kind of "virtual plaster" to fill the damaged or missing elements
- use a block of rough material from which the user will cut needed parts and fill the gaps
- transform and resize the elements as much as required in order to fit them in the right position
- "describe" the missing part between two or more extant parts and complete it with the same material
- readapt general data such as the column distance (intercolumnium), monument height, thickness of the walls, etc.

novice user (student, tourist): as a dissemination / pedagogical medium

- Learning about such features as the different architectural orders (Ionic, Doric and Corinthian, which are mainly distinguished according to their columns and capitals)
- Understanding the composition of a structural element such as the column and its parts
- Feeling through haptic applications the differences between the Ionic and Doric column (sharp or obtuse slab edges respectively)
- rescaling architectural elements and positioning them in the correct space (enhancing space perception)
- understand the principles of harmony and equilibrium in ancient monuments, as well as the relation to the human scale (an extra could be the appearance of a column from another ancient monument just beside the Asclepius Temple for comparison purposes)
- understand the function of the main features of an ancient temple (wing, cella, roof)

Design step-by-step scenario

objective:

to try varied reconstruction hypothesis and choose the most plausible



Design step-by-step scenario

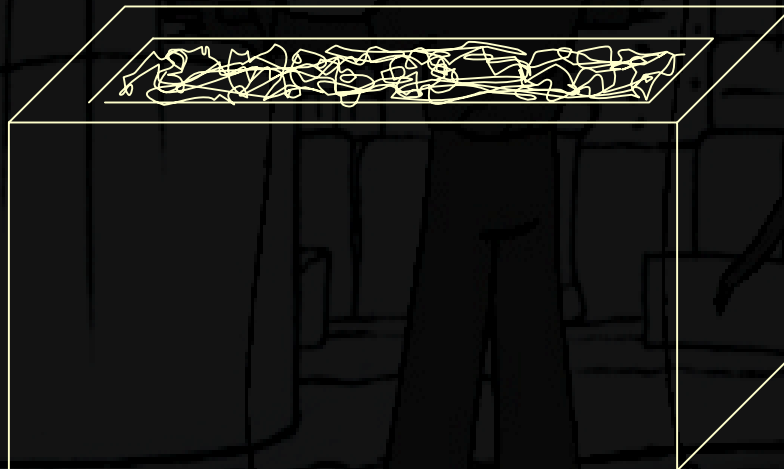
- Explore various levels of reconstruction
- Investigate different historical periods (evolution through time)
- Examine alternative scenarios of how the site used to be
- Observe effect of a temple's symmetric harmony when placing a different than originally intended element
- Perform asks that bring out issues of perspective, balance, proportion, scale.

more sophisticated interaction methods

haptics

Marble/stone surfaces

- Column slab edges (sharp vs. polished)
- “Anathyrosis”



To study details that may not be easily visible otherwise

haptics



thank you