Archaeological Landscape reconstruction

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Presentation and field of activity

- Researcher in the field of: landscape archaeology, development of VR applications dedicated to virtual heritage, open source approach to cultural heritage
- Co-director of the VHLab at CNR ITABC in Rome
- National CNR Coordinator of the Virtual Heritage Unit
- Director of the Italian School of Virtual Archaeology
- Scientific Director of the annual exhibit ”Archeovirtual” dedicated to virtual archaeology
Archeological Landscape reconstruction

*How do the territory appear today? Where are the archeological evidences? What are their function and relation?*

- Aims at reconstructing the contemporary landscape
- It is a process that starts ”mapping the space”:
- The result of the process is a spatial, geografical, 3d, interactive digital reconstruction that can be further developed inside a VR system or into a not-interactive one (movie)
Ancient Landscape reconstruction

"how do a territory might have been in a certain historical period and at a certain latitude?"

- Studies the dynamic processes of the natural and anthropic landscape
- Aims at proposing a reconstruction of a POTENTIAL landscape
- It uses a strong ecological approach
What do we need for.. Archaeological Landscape reconstructions

- CARTOGRAPHIC PRODUCTS
- AERIAL AND SATELLITE IMAGES
- ARCHAEOLOGICAL AND HISTORICAL MAPS
- GPS localisation of the evidences
- REMOTE SENSING ANALYSIS
- GIS AND DATA SPATIAL ANALYSIS
- 3D SCANNER AND PHOTOGRAMMETRIC ACQUISITION
Some results: Appia project
Il museo narrativo del parco archeologico dell’Appia Antica

itra

Menu: mouse centro
What do we need for.. Ancient Landscape reconstruction

- GEOLOGICAL MAPS
- PALEO-ENVIRONMENTAL STUDIES
- PALEO-BOTANIC STUDIES
- LAND-USE MAPS
- REMOTE SENSING AND SPATIAL ANALYSIS
- GEORADAR
- DIGITAL LIBRARIES OF MODELS AND VEGETATIONS
- (PROCEDURAL MODELS)
Results from Virtual Rome Project
www.virtualrome.it
And from Ca'Tron project

The reconstruction of a landscape in the North part of Italy in the LGM (Late Maximum Glacial period), Bronze Age, Roman and Medieval periods.
Chinese Landscape Conservation

Part of the West Han Dynasty VR museum project is focused on landscape digital acquisition and conservation of important archaeological sites.

Our mission is to develop more and more rapid and affordable (non-destructive) techniques and methodology to acquire archaeological sites, include them in their landscape, while they are excavated, before they are destroyed forever.

The project aims to preserve the archaeological sites creating virtual reproductions useful for analysis, studies and public access and to build a landscape virtual museum, where scholars can meet and exchange interactively information, creating real-time multi-user sessions dedicated to analysis and interpretation or even problem solving, accessing high resolution models from the digital library, connecting them to original lost contexts.
West Han Dynasty archaeological landscape: initial work
West Han Dynasty ancient landscape: initial work
Procedural Modelling and Chinese archaeology

- Procedural Modelling makes use and develops algorithms to generate digital environments, using shape grammar and starting from the definition of set of rules.
- It is particularly suited for regular orthogonal city-structures and building typologies.
- It takes geographic information as reference.
- It enable the integration of not-procedural models.
- For these reasons it could be successfully applied in the Chinese case study.
Application to an urban Roman archaeology case: Bologna
The Roman city of Pompeii was completely reconstructed, using a “shape grammar” with the production of rules that evolve, creating more and more details.

The hierarchical structure and the annotation of the models can be reused, creating different procedural variations (MÜLLER et al. 2006).
Long Period aims

- Every day life analysis
- Ancient land use
- Natural resources employment
- Virtual Museum full integration