

# An interactive 3D reconstruction of a funeral in Andriuolo's Necropolis in Paestum

ROBERTO ANDREOLI<sup>1</sup>, ROSARIO DE CHIARA<sup>1</sup>, UGO ERRA, VITTORIO SCARANO<sup>1</sup>,  
ANGELA PONTRANDOLFO<sup>2</sup>, MARIA LUIGIA RIZZO<sup>2</sup>, ALFONSO SANTORIELLO<sup>2</sup>

<sup>1</sup> University of Salerno Dipartimento di Informatica ed Applicazioni "R. M. Capocelli", Italy

<sup>2</sup> University of Salerno, Department of Cultural Heritage, Laboratory of Archaeology "M. Napoli", Italy

## ABSTRACT

*This project consists of a 3D reconstruction of a funerary ritual dating back to the Lucan period of the town Poseidonia-Paestum. The necropolis situated in the area of Andriuolo, to the north of the old inhabited area, was selected as experimental sample, subject to the applications presented in this work. We decided to recreate the main steps of the funerary ritual paying special attention to the cortege accompanying the dead to burial. The representation was made by the graphic engine of the editor program of the HalfLife2 video game and was supported by a deep analysis of the funerary context and of the iconographic repertoire.*

## INTRODUCTION

The representation of a funeral in Andriuolo's necropolis of Paestum was made by the graphic engine of HalfLife2 video game, which enables the development of photorealistic reconstructed virtual scenes.

It was possible to recreate objects and environments within a typical daily context, allowing the visitor to travel along time and history and interact with them.

This device to enjoy the experience of living in the past in this case is a support to the traditional ways of diffusing culture. However it succeeds in communicating the results of research only when it strictly observes the scientific data.

The work was supported by a deep analysis of the funerary context and of the iconographic repertoire known through the funerary paintings of the town of Paestum dating back to the IV century a.C., at the time of the occupation of the town by the Lucans (a people of Italian origin) (CIPRIANI, 2002; GRECO PONTRANDOLFO, 1979; PONTRANDOLFO, 1987; PONTRANDOLFO-ROUVERET, 1992). The Lucan domination did not modify the organization of the urban spaces, but it caused a radical change in the funerary ritual. In this period, compared with the Greek age, the objects accompanying the dead multiply and become qualifying signs of sex, age, and social class differences; burials take place according to nuclei around the main tomb, reflecting a social organization based on family groups. The richest tombs are decorated on the four sides by painted slabs, expressing the values and ideals of the ruling groups by images. The corpus of slabs, published in 1992 by A.Pontrandolfo and A.Rouvet (PONTRANDOLFO-ROUVERET, 1992), is today housed in the Archaeological National Museum of Paestum, but only some paintings and a few objects furnishing the tombs are exhibited, so a complete enjoyment of the original contexts is not possible.

The necropolis situated in the area of Andriuolo, to the north of the old inhabited area, was selected as experimental sample, subject to the applications presented in this work.

We decided to recreate the main steps of the funerary ritual paying special attention to the cortege accompanying the dead to burial. As regards its chronological setting the performance takes place in the IV century a.C.

It is at dawn, the sky is cloudy. The procession takes place in the open air on an uncultivated land of a plain area; it starts outside the northern walls of the town, by Porta Aurea and then it reaches, going northwards, the area of the necropolis (the present Andriuolo suburb). The gate, sided by the two towers, has been reproduced as it probably was in the half of the IV century a.C., according to S.Blum's reconstruction (BLUM, 1987, p. 575-591). To the east hills can be seen, then mountains; on the other side to the west, the sea can be made out.

The scene is framed by hedges and bushes, beyond which the landscape of the sea, the temples, the vegetation...far away can be seen.

The action takes place in two steps and in two different places:

- Scene 1) Outside the town: the cortege goes out from Porta Aurea and goes towards a grove on the opposite side;
- Scene 2) Necropolis: on the open tomb the burial rite is celebrated.

The viewer goes from the first to the second scene through a "teleport" device situated in the grove (or at the point of the scene where the cortege, in the scene 1, disappears).

## 1. THE ACTORS

All actors were reconstructed by an accurate study of the characters on the painted slabs.

The feminine characters wear dresses long at their ankles, leaving the arms bare. The women of high social standing distinguish themselves for their veiled head, while their maids, unmantled and with their uncovered head, have their hair short at the cheeks, probably as a sign of mourning. (EURIPIDES, *Alcesti*, 96-100).

The adult and young veiled woman take offers as for example a patera with pomegranates and eggs, the vases furnishing the tomb, wreaths of flowers.

The young figures are the children of the dead woman or adolescent members of the family; they are beardless with short hair, they are mantled like the adults lined up by height.

Men are bearded, wear a tunic and a mantle and perform specific functions: they are the relatives of a dead woman, the flute player, a man dragging an ox by its horns. The dead is a woman and shows herself prepared for the exhibition and the ceremonies. She is transported on her funerary bed, with her head laid on two pillows, dressed with a long tunic and a mantle and adorned with a red coloured diadem.

Other two characters are disconnected from the historical reconstruction: the cicerone, a middle-aged man addressing the viewer, soon after his entrance into the performance, informing him about the imminent passage of the cortege and informing him about the rite and the social conditions of the dead woman and the viewer, who enters into the scene materializing into a character of our age, who can move in the space, observe and interact with the performance. His entrance into the scene takes place by Porta Aurea, looking eastwards.

He is free of exploring the environment and following the procession.

He is also free of not following both the cortege and the cicerone and so of missing the related information.

If he goes to the point where the cortege disappeared he will be "teletransported" beyond the grove, to the burial place (scene 2). Here he will take part into the funerary rite without interrupting it.

## 2. COMPOSITION AND ACTION OF THE CORTEGE

The performance takes place by the animation of all figures, each of them having its own way of gesturing and taking different objects: the man dragging the sacrificial ox opens the cortege; then the women with the offers follow, together with the crying maids; behind them the bed with the dead woman comes, transported by four men, accompanied by the flute player, the dead woman's children and the rest of the family. The maids close the cortege.

The procession (scene1) advances with slow and sad step, walks solemnly, uttering a background of continuous lament, sometimes interrupted by louder moans. While walking, some actors say lament and desperation sentences: the dead woman's husband and son remember her and praise her value as bride, mother and mistress of the house.

After they have reached the small wood, the cortege disappears from the scene to reappear after round the tomb. (Scene 2).

Here some women give their offers (vases, wreaths of flowers, fruits) to a veiled feminine character crouched on the edge of the counter-grave and looking towards the grave, who lays them one by one beside the coffin. Each woman accompanies her offer with a sentence emphasizing the meaning of each object and its link with the dead woman: the *lebes gamikos* (which once had accompanied her on her wedding day), the *hydria* (symbol of the domestic tasks and the social role of women, mistress of the *oikos*), the *lekythoi* and the *lekane* (containing the perfumed oils and ornaments), the cup, the *skyphos* and the *kylix* (used in her life by the bride to welcome her husband coming back from the fight), wreaths of flowers and fruits.

All objects were necessary to face the hard journey to the other world.

A masculine character closes the performance anticipating the imminent celebration of funeral games in the dead woman's honour.

After the burial a fade effect lasting some seconds darkens the scene. Then the following map is loaded: the field where the funerary games take place.

These are the scientific assumptions that have allowed a reliable reconstruction, now we describe the technologies used to carry it out.

## 3. 3D RECONSTRUCTION GUIDELINES

The 3D reconstruction is developed using a state-of-the-art 3D engine called Source engine from Valve, used for Half Life 2 and recently released. The engine allows to build virtual worlds (known as "mod" (as in modifications)) where the user is not only visiting a 3D virtual environment but he/she can also interact in first person with the synthesized characters that are acting in the scene. Source is a first-person-shooter games engine that provides a photo-realistic 3d environment that enable a quick and effective development by a WYSIWYG World editor (Valve Hammer Editor). Source also provide Artificial Intelligence tools, such as Path finding and Decision Making algorithms that allow non-player characters (artificial representation of humans, animals, objects) to react with users' actions and with the other

non-playing characters. The non-player characters can be also designed realistically since the engine provides skeletal animation, morphing, facial animation and animation blending so that the interaction is extremely shapable according to the designer needs.

In a sense, the main difference, from user's point of view, with traditional 3D scenes is simply that he/she is a character in a reconstruction and interacts with the environment and the characters. Of course, from the designer point of view, this environment offers exciting new avenues for providing content and information that are hidden and naturally provided to the user, e.g., in the form of a speech that is delivered directly from a character to the user if he/she approaches the character close enough.

#### 4. PROJECT DETAILS

The use of videogames engines as a state-of-the-art, low cost systems, to provide virtual reconstruction to a wide variety of audience has been well explained in various previous works (ANDERSON, 2003; PUJOL, 2004). In particular (BOSS, MEISTER, 2003) makes a comparison among Real Time Strategic (RTS) game engine and the First-Person Shooter (FPS) game engine. Various points of interest exist in our project respect of traditional approach in the design of virtual reality. Virtual reality technologies are usually aimed to reconstruct the architecture of a particular site. Traditional virtual reality does not explain, for instance, life in the communities during a specific historical period; instead, it offers a static hyper realistic reconstruction of a site, which does not distinguish between the actual remains and hypotheses. This is mainly due to the limitation of technologies used.

Our goal is deeply different, we intend to enable user to really participate to the rite, in fact, particular attention has been paid in modelling the semantic of the interaction between user and the characters present in the rite, and between the user and the architecture.

As a sample of the final results quality we provide Figure 3 where the reconstruction of a woman is shown and can be compared with Figure 2 showing the original slab. In Figure 3 is shown the reconstruction of the Porta Aurea, this results shows how the usage of videogames technology is really effective in order to produce interactive, high quality 3d environments.

#### REFERENCES

- BLUM, I. (1987) – Le mura. In *Atti di Taranto*. Taranto: Istituto per la Storia e l'Archeologia della Magna Grecia; (Atti del Convegno di Studi sulla Magna Grecia; XXVII), p. 575-589.
- CIPRIANI, M. (2002) – Poseidonia. In GRECO, E., *Gli Achei e l'identità etnica degli Achei d'Occidente*. Paestum: Pandemos, (Tekmeria; 3), p. 363-388.
- GRECO PONTRANDOLFO, A. (1979) – Segni di trasformazioni sociali a Poseidonia tra la fine del V e gli inizi del III sec. a.c. In *Dialoghi di Archeologia* 2,1., Roma: Quasar, p. 27-50.
- PONTRANDOLFO, A. (1987) – Le necropoli dalla città greca alla colonia latina. In *Atti di Taranto*. Taranto: Istituto per la Storia e l'Archeologia della Magna Grecia; (Atti del Convegno di Studi sulla Magna Grecia; XXVII), p. 225-265
- PONTRANDOLFO, A.; ROUVERET, A., ed. (1992) – *Le tombe dipinte di Paestum*. Modena: edizioni Panini
- SANTORIELLO, A.; *et al.* (2005) – The GIS Application to the Spatial Data Organization of the Necropolis of Poseidonia-Paestum (Salerno, Italy), cop 2005.
- ANDERSON, M. A. (2003) – Computer Games and Archaeological Reconstruction: The Low Cost VR. *Computer Applications and Quantitative Methods in Archaeology*.
- BOSS, M.; MEISTER, M. (2003) – On using State of the Art Computer Games Engines to Visualize Archaeological Structures in Interactive Teaching and Research. *Computer Applications and Quantitative Methods in Archaeology*.
- PUJOL, L. (2004) – Archaeology, museums and virtual reality. *DigitHVM Revista Digital d'Humanitats*.

## FIGURES



Fig. 1 – Andriuolo' tomb 84. Slab west. Feminine character's detail.



Fig. 2 – Feminine character's reconstruction.



Fig. 3 – The reconstructed Porta Aurea.