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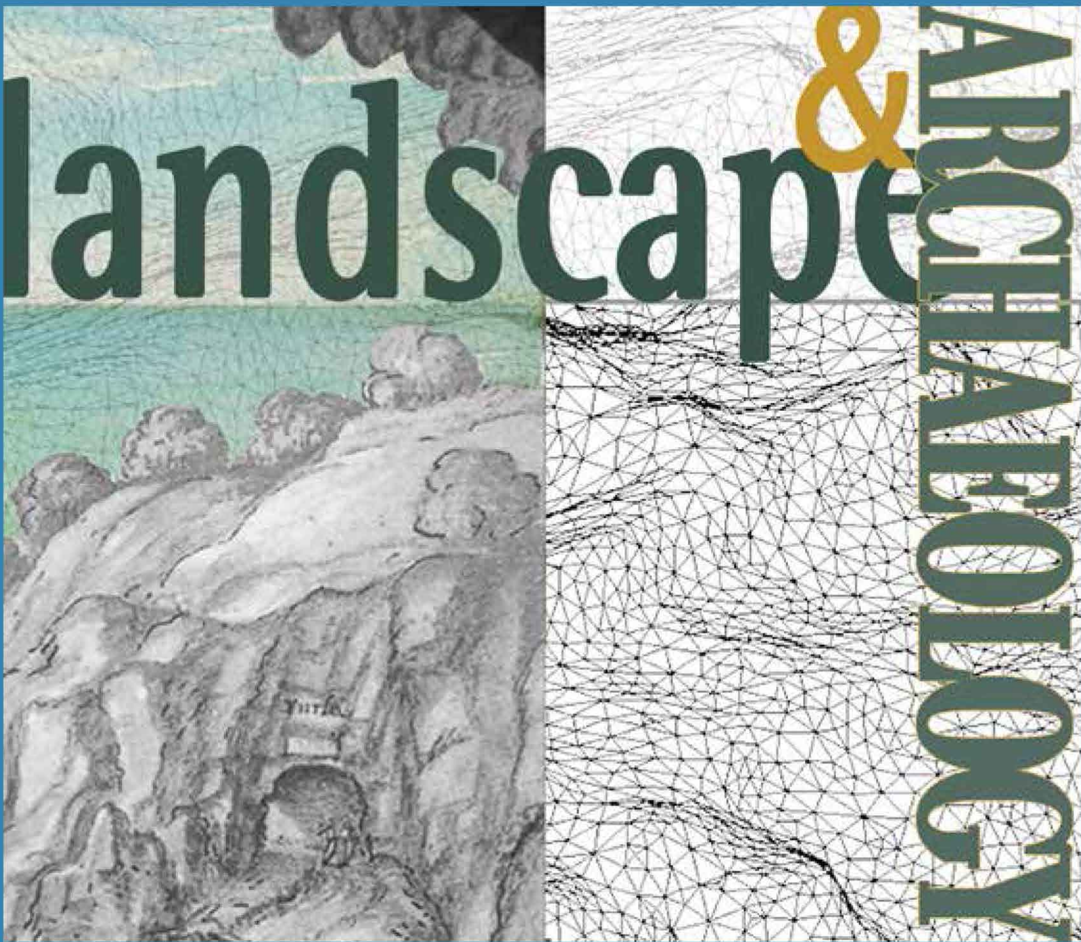

CENTRO STUDI VITRUVIANI

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Summary

Virtual Heritage: Some Experiences of Survey of Archaeological Finds by Low Cost Techniques

Paola Puma

☞ DIDA, Dept. of Architecture, University of Florence, Florence, Italy – paola.puma@unifi.it

✔ KEYWORDS: Virtual heritage, survey of archaeological finds, faliscan finds, Narce, etruscan finds

ABSTRACT

The paper presents the first two outcomes of the "Virtual heritage projects" research program, conducted in 2014-2015 by the group coordinated by the author and born to fulfill a specific scientific project; the aim of the research program was the idea of rethinking in terms of low cost and speed the data acquisition of survey of archaeological finds -when is only aimed at advanced visualization for musealisation- basing the (at that time) emerging technique of photo modeling (Shape From Motion- SFM).

The possibility of "representing the landscapes" of archaeological contexts in an effective and real impact in terms of musealisation, is transmitted by experiences of different types and scales as well in the reconstruction of the original environmental context as in the 3D model display of small objects at a larger scale than the real (Bertocci, Arrighetti, 2015). The use of HD 3D models of archaeological finds has the added value of many advantages linked to the possibility of visual and perceptual contact (and in more advanced cases, also of the interaction) with an unavailable object in time or in place or not accessible for reasons of conservation; this allows a number of advanced features, such as the vision larger scale in respect of real to be able to dwell on details not visible to the eye rather than the virtual restoration (Ippoliti, Meschini, 2011). The modeling of archaeological finds require a realistic representation of the nature morphologic, material and of conservation of artifacts with irregular geometries; photomodeling has introduced a working environment that allows the representation of three-dimensional objects based on global integration of phases of survey (which we have used for shooting with control points for the respect of measurement of the objects), modeling and representation (Remondino, Campana 2014).

The "Falisci in 3D" Project

The first application of research (Fig. 1) was realized in 2014 on the occasion of the exhibition "The Hill people. Faliscan and Capenas finds in the National Archaeological Museum of Florence "(Camilli, Sorge, Zifferero 2014), dedicated to a broad selection of more than 800 finds from the same museum.

The exhibition allowed to retrace many complex dating from the late Bronze Age till the Romanization of the area of *Faliscan* settlements, including the Necropolis of Pizzo Piede, located in Narce (Viterbo-Italy); here was excavated the grave 23 (B), where were found about 40 objects belonging to a woman of the highest social level. The grave goods in the project

Fig. 1. The "Falisci in 3D" Project: the Faliscan territory; the grave goods from the tumb 23 (B); the objects documented; the post processing and the resulting 3D models.

come from a burial consisting of a sarcophagus in a deep pit with a niche adjacent to contain the rich furnishings (Camilli, Cianferoni 2014): the goods personal of the defunct (including princely rank items like an elaborate belt by bronze plating) and the home tools placed with the body (including a censer in bronze plate and a tripod complete of a bigger bowl and three smaller bowls).

The surveys were performed on about 20 pieces, in about 2 months and with mixed results; the outcomes, in fact, that can be considered reliable -both in terms of the compliance of metric characteristics as of the realistically visual features of the materials- may be declared for 15 objects, whose 3D models were displayed in the exhibition dedicated by a video projection of objects in scale from 50:1 to 100:1.

The video projected in the dedicated section of the exhibition is available at the link https://youtu.be/OT7MXqyf2ZM

The "Baratti in 3D" Project

The second case study is referring to finds from the monumental Etruscan Necropolis of San Cerbone, located in the Archaeological Park of Baratti and Populonia, so important in the

landscape of Etruscan funerary archeology (Zifferero 2000). The vast resources that made the Etruscan town of Populonia a very rich city thanks to metalworking emanating both from its territory and from the island of Elba, allowed to the most powerful families around the VII century BC, to build the monumental necropolis that we can see in front of the sea of Baratti, where they have built rich burials of precious objects coming from far away and so impressive as to be known as the "tombs of the princes." In 2015 thus it took place at the Museum of the Territory of Populonia in Piombino the campaign of survey of two grave goods from the Tomba del Bronzetto di Offerente and Fossa della biga (Fig. 2).

Fig. 2. The "Baratti in 3D" Project: the Tuscan territory related to the project: the Archaeological Park of Baratti and Populonia; the two tumbs related to the project: Tomba del Bronzetto di Offerente, Fossa della biga; the post processing and the resulting 3D models.

By calibrating different settings of data acquisition and processing, we reached the quality objectives defined by metrically reliable 3D reconstructions in double graphics output: geometric "not real" output for the appreciation of the dimensions and morphology of the pieces and texturized output for the visual appreciation of their workmanship's value and characteristics of the material. The survey results rated as excellent by the archaeologists, with respect to the limits project time's and budget's, have amounted to 80% of the total 54 pieces documented.

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