



## TECHNOLOGIES AT THE SERVICE OF PROMOTION. 3D MODELING, VIRTUAL RESTORATION AND AUGMENTED REALITY APPLIED TO MARRC'S COLLECTION.

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In the last few years, Science, Art and Education had to rearrange their communication strategies in relation to the demands of a public increasingly attracted by the potential offered by new IT. The development and the application of these technologies in the field of Cultural Heritage has introduced new horizons in terms of research, preservation, monitoring of conservation status, restoration activities, promotion, interactive fruition and accessibility also within the Museums.

In this poster will be presented the results of 3d rednering and augmented reality application, results of the collaboration between the National Archaeological Museum of Reggio Calabria (MARRC) and the IPCF-CNR of Messina. With the aim of making the MarRC collection much more accessible, interactive and in line with the new visitors needs, have been created new interactive and informative contents from 3d models of artifacts easily viewable on portable personal devices (smartphones, tablets) or other multimedia supports.

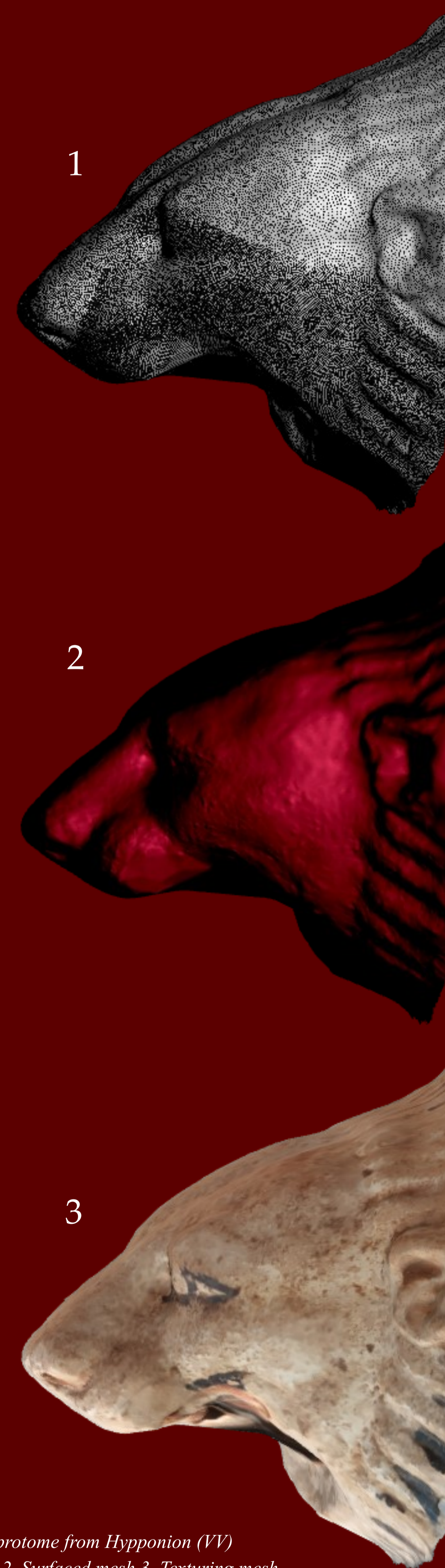
On the occasion of the day "Arte e Scienza", organized by the Italian Association of Archaeometry (AIAR), the team of the IPCF-CNR institute of Messina created a textured three-dimensional model of a leonine protome from Hipponion (Vibo Valentia), it was an architectural element of a sanctuary, a drip molded as a lion head, belonging to the collection of the National Archaeological Museum of Reggio Calabria.

Scans were performed through the use of the "Freestyle" portable laser scanner of the FARO company with single-point precision  $\leq 1.0\text{mm}$ . Photo sockets were then taken on the exhibit for the realization of the texture to be applied to the point cloud.

Point cloud processing has been performed with dedicated Geomegic wrap and 3D Zephyr software. The model, once realized the triangulated mesh has been texturized. an animated rendering of the exhibit has been realized for a better visualization.

These technologies not only represent a step forward in terms of fruition but also an opportunity for analysis and diagnostic: virtual models can be used as important basic tools to advance hypotheses of reconstruction and to analyze methods and techniques of ancient productions. The communicative effectiveness of these models can be much more enhanced if inserted in a context of augmented reality that provides an overlap between the representation of real elements and additional virtual information layers (as digital 2d or 3d returns).

Finally the application of these technologies to MARRC's collection has proved to be useful for several reasons: 1. to make accessible objects stored in the museum warehouses; 2. to allow the visitor to better enjoy their experience of fruition, not simply by looking at them through a glass, but having the opportunity to interact with artifacts; 3. to provide the visitor the exact original conformation of a find (a digital reconstructive hypotheses), without intervening directly on it and preserving its integrity.



Leonine protome from Hypponion (VV)  
1. Point cloud 2. Surfaced mesh 3. Texturing mesh

### References

- Arduini G., *La realtà aumentata e nuove prospettive educative*, in Education Sciences & Society, 3, Ri-pensare la pedagogia, ri-pensare l'educazione, (2012), pp. 209-216.  
Colizzi L., Martini A., Chionna F., *Augmented Reality Applied to the Diagnostics and Fruition of Cultural Heritage*, in Conservation Science in Cultural Heritage, (2010).  
Jasink A. M., Dioniso G. (a cura di), *MUSINT II Nuove esperienze di ricerca e didattica nella museologia interattiva*, FUP Firenze University Press, 2016.  
Palombini A., *Narrazione e virtualità: possibili prospettive per la comunicazione museale*, DIGITALIA, Rivista del digitale nei Beni Culturali. annoVII, n.1. Roma: ICCU, 2012.  
Pujol L., *Archaeology, museums and virtual reality*, «DigitHVM.Revista Digital d'Humanitats», 6, (2004).  
Tucci G., Cini D., Nobile A., *A Defined Process to Digitally Reproduce in 3D a Wide Set of Archaeological Artifacts for Virtual Investigation and Display*, in: Journal of Earth Science and Engineering, 2 (2), David Publishing Company, ISSN 2159-581X, 2012.