

# DIGITAL TOOLS FOR VIRTUAL ARCHAEOLOGICAL EXCAVATIONS: BACK TO THE FUTURE...

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Based on the results of a series of past and current projects whose the planned exploration of the Celtic and Gallo-Roman cultural site of Ablis (Yvelines, France) in a partnership between the University of Paris-Sorbonne and the Regional Service of Archeology Ile-de France, this paper aims to consider the theme of the "virtual excavation" from its operational implementation at different scales, from the archaeological site in its broader sense (as a part of a natural environment and / or landscape) to the artefact and museum object.

The digitization of the complete « chaîne opératoire » from the fieldwork to the restitution to the different publics, links different disciplinary fields and practices, drawing on the innovative technological infrastructures from 3D imaging.

The proposal will focus jointly within the fields of research (aerial surveys, exploration of archaeological sites, study of heritage objects), of university training, continuing education and technical expertise. Innovative solutions in terms of preservation (management and digital archiving of collections with the possibility of virtual 3D analysis), conservation (the internal knowledge of a piece allows to anticipate its restoration) and museography. The new paradigm that we call "virtual excavation" by the way of 3D digital recording in very high resolution of stratigraphies, archaeological structures and artefacts changes fundamentally our perception by turning once and for all the ancient paradigm of the archaeological excavation thought, up to now, in terms of an irreversibly destructive action (a book

whose the archaeologists would remove the pages...)

Digital tools enable to start over as many times as necessary an excavation process while expanding the possibilities to create remote analysis teams by using interactive 3D visualization platforms. Conservative and non-invasive actions concerns the development of optimized equipment, parameters and protocols for 3D and multispectral imaging on drones to document, preserve and enhance the archaeological and environmental heritage, with possible transfers of technologies.

In this context we propose to raise three issues:

the expanding of possibilities in university and continuing education offer (archaeologists, curators, restorers) around innovative pedagogies (3D screens, augmented reality, virtual reality, etc.).

A reflection on the notion of "archaeological reserve" applied to heritage objects as well as sites and monuments.

A contribution to developments in the fields of 2D, 3D and multispectral imaging, virtual reality and interactive 3D visualization platforms.