ABSTRACTS

01   COMPUTATIONAL APPROACHES TO DIVERSE, COMPLEX AND LARGE ARCHAEOLOGICAL DATASETS: THE EXPERIENCE OF THE CDAL AT CAMBRIDGE

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Presentation Format: Oral

The Computational and Digital Archaeology Lab (CDAL), at the McDonald Institute for Archaeological Research of the University of Cambridge is a new research laboratory specialised in the archaeological application of computational and digital methods, including GIS, agent-based simulation, network analysis, spatial statistics, remote-sensing, machine learning, digital recording methods such as photogrammetry or LiDAR, complex text data mining and digital support for fieldwork tasks. Current research examples include the detection of archaeological sites in large areas of South Asia, the high-resolution modelling of ancient transcontinental routes and the computer simulation of cultural transmission of pottery decorative styles.

In this paper we will briefly describe current CDAL projects involving complex, multi-temporal and large datasets and present the conceptual and methodological approaches adopted to deal with these such as the use of high-performance computing including parallel computing, cloud computing and virtual machines and the development of algorithms and their derived code.

The paper will present current workflows from project design and execution to dissemination, which includes not just open access publication but open code procedures. Problems derived from the use of diverse coding languages (and software), research design and interests for the co-development, integration, comparison and sharing of procedures will be highlighted and discussed.

02   NAVIGATING A NEW DIGITAL INTERFACE: USING AUTOMATED IMAGE RECOGNITION TO IDENTIFY POTTERY IN THE ARCHAIDE PROJECT

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Archaeological Automatic Interpretation and Documentation of cEramic (ArchAIDE) is a H2020 funded project (2016-2019) developing digital tools to support archaeologists in recognising and classifying pottery. ArchAIDE is not designed to replace the knowledge of pottery specialists, but seeks to complement by speeding time consuming tasks, provide support for non-specialists, help students learn more about pottery recognition, and aid in the collection of metadata needed to describe the pottery. ArchAIDE is developing a tablet-based mobile app which relies upon image recognition and uses deep learning to narrow and suggest possible matches. While ArchAIDE has been careful to design a tool that allows classification decisions to be made by users at key points in the recording workflow, the app uses digital tools and methods for a significant tasks that were previously carried out using analogue methods. This paper will explore how users are engaging differently with the archaeology when using a digital workflow for identifying, classifying and recording pottery, as observed by the ArchAIDE project partners in early testing. This will include issues around using digitised comparative collections rather than paper catalogues, using the app to identify pottery while still in the field-rather than during post-excavation, how users might 'see' pottery differently through a digital rather than analogue analysis, and whether pottery identification using a digital interface changes knowledge transmission and learning processes. While the purpose of the ArchAIDE project is to make pottery identification faster and easier, this paper will pause to reflect and critically engage with moving to a digital workflow, and how this may influence how archaeological knowledge is produced and understood.

03   THE DEVELOPMENT OF A TYPOLOGY FOR MAJOLICA FROM BARCELONA AND VALÈNCIA BETWEEN 13TH AND 18TH CENTURIES. A COMPOSITIONAL EDMA APPROACH

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To present, the classification of ceramics is largely carried out by heuristic methods based on someone's expertise and the use of analogue catalogues held in archives and libraries. These archives have the classifications currently encoded in drawings and written descriptions. However, in the case of Majolica products there does not exist a general accepted catalogue of types. Traditionally, its classification is based on art history criteria mainly related to decoration.

Within the frame of ArchAIDE research project (Archaeological Automatic Interpretation and Documentation of cEramics, European Comission H2020-693548) we are developing a new typology for majolica, focussed on Barcelona and Valencia area products. The aim is to obtain a digitization that can successfully identify them. Thus, in order for ArchAIDE system to be able to deal with majolica the transformation of the paper and digital publications in a digital description is needed. It requires digitize one by one the drawings of each pottery coming from well-defined archaeological context to be introduced in a geometric 2D description of each ceramic class in the database. To determine these classes is necessary standardize the drawings at the same scale and try to observe