

Using Virtual Worlds in Communicating Archaeology

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Abstract

The Museum of Cultural History at the University of Oslo, Norway, has a long history of digitizing cultural heritage in 3D. Applications vary from exhibitions and public outreach to academic research, university and elementary school teaching. To truly engage our audiences, we are forced to think creatively. This poster presents examples from recent projects at the museum that have been exploring ways to facilitate people to look closer and use digital 3D models as a gateway to further exploration.

CCS Concepts

• Human-centred computing → Interaction design → Empirical studies in interaction design; • Computer methodologies → Computer graphics → Graphics systems and interfaces → Mixed / augmented reality

1. Introduction

Acquisition of 3D data of cultural heritage objects and sites has received a considerable amount of attention in recent decades, but while libraries of 3D assets have grown, their active use has remained a challenge. This poster presents recent attempts to use this data more effectively. While the two projects presented in this paper have very different target audiences and adopted different approaches, they share several commonalities that are relevant to the effective use of 3D data for learning, including the importance of contextualization of data, structured instructions, and social interactions.

2.1 Archaeology for Youth

This travelling exhibition was created as part of the “Archaeology for youth” project that sought to teach fundamental principles of the archaeological discipline while raising awareness of the work of the museum in local communities, particularly aimed at younger audiences. Building on experiences from earlier work, this project attempts to engage with the challenge of social interactions in learning and outreach and was specifically designed with human-to-human mediation as a core design principle.

The core of the exhibition was a set of stackable wooden cubes with each face focusing on a different principal theme of rescue archaeology in Norway including survey, reason for excavation,

stratigraphy, museum curation and concepts of deep time. QR codes were used to provide customized digital content that could be easily changed as the exhibition was moved to different locations in the museums district.

Some of this content was bespoke and included mixed reality scenarios that could be viewed through VR headsets (Oculus) or iPads. Other QR codes linked to existing online resources such as image and 3D model catalogues, or long form stories relating to recent excavations in the nearby area.

2.2 Human-to-human mediation

While the exhibition functions on its own, it is designed to be accompanied by a heritage interpreter. Reasons to interact with this interpreter are introduced at several levels. The friction that comes with the use of technology, such as different interfaces or unfamiliar content, was considered as an opportunity for face-to-face discussion. For example, while online catalogues could be explored by an individual on their own phone, greater contextualisation can be achieved through physical demonstration with an accompanying iPad. The high fidelity large screen that acts as billboard when not in use, doubles up as a way to stream content from these iPads or VR headsets, allowing bystanders to be included in these interactions of others. Some scenarios were specifically designed to be collaborative, such as an activity where one participant holding an iPad displaying an AR model of a stave church doorway had to guide a second participant to a specific location on the augmented content.



Figure 1: Travelling exhibition using digital content. Scan the QR code to explore the exhibition in Augmented Reality.

3.1 Virtual Worlds in Teaching Archaeology

These learning scenarios were developed at the museum together with teachers at the Department of Archaeology, Conservation and History and used in teaching archaeology courses at the University of Oslo.

The learning scenarios were developed in conjunction with the Erasmus+ project Virtual Worlds in Teaching Archaeology and use the BitFROST platform which was implemented at the museum in recent years [BPIU24]. Two learning scenarios were developed for courses in classical- and stone age archaeology.

3.2 Stone age learning scenario

The students were provided with assignments as well as a link to a 3D-model of a lithic tool production sequence. The scenario focused entirely on a close examination of this 3D model. Because all the different components of the tool production sequence were scanned individually and then virtually refitted, the artefacts could be studied from any angle by the students, allowing them to explore and understand the lithic blade production sequence in detail. The BitFROST viewer also provided the possibility to toggle each individual artefact so that the spatial relationship between core and blades could be studied in 3D.

3.3 Classical archaeology scenario

The subject for this scenario was a corpus of ancient Greek pottery vessels from the museum's collection which were documented by means of photogrammetry and supplemented with models from the Academic Art Museum in Bonn, documented by the Bonn Center for Digital Humanities.

Students were asked to apply information learned from traditional course material. The digital twins were used as 'spatial notebook' to answer questions and cross reference other types of media.

A survey showed the students valued the ability to explore complex 3D data at their own pace.

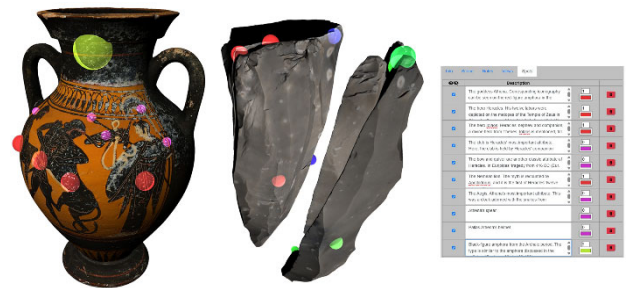


Figure 2: Annotated 3D models in the BitFROST platform.

4. Discussion

We have found that in both of the projects discussed in this paper, putting effort into contextualizing the digital data was crucial. The digital data was anchored in a bigger narrative which was not just mediated with digital media but also with physical resources, such as the panels and 3D prints of real archaeological artefacts. Social interactions, either through personal conversation or teacher led structured exercises, helped to give meaning and purpose to otherwise ephemeral digital content.

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References

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