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3DWorkSpace – an open science/interactive tool for 3D datasets

Research project (NWO Open Science Fund), Jill Hilditch & Jitte Waagen (principal investigators), Hugo Huurdeman, Tijm Lanjouw, Loes Opgenhaffen & Leon van Wissen

The continued growth of digital methods and practices within the humanities over the past 30 years has provided a wealth of datasets that are transforming the discipline at an astonishing rate. New tools are urgently needed for 3D datasets to improve their accessibility, facilitate engagement and interaction with the datasets, and promote two-directional knowledge transfer. The 3DWorkSpace project aims to deliver such a tool by adapting the open-source Voyager 3D digital museum curation tool suite¹ and promote interactive engagement with traditionally complex digital datasets. Embedded structured guidance, or Learning Pathways, will be generated to provide training to promote the competence and skills necessary for interpreting 3D datasets. Through the creation of annotated personal 3D collections, which can be tailored to specific learning goals or interests, broader narratives can be generated and new avenues for knowledge publication can be opened up.

Open access 3D models are often published on online platforms with limited options for interactive communication and education. Although some 3D collections are published with their associated metadata, paradata, annotations and interpretations, these currently provide no tools for re-use.² The Voyager 3D digital museum curation tool suite allows for interactivity and enrichment of the data but does not enable re-use or open content creation in a multi-user environment. Annotating models (adding information to a 3D model without modifying the model itself) is possible for the creators of the content but not for the end-users. 3DWorkSpace will facilitate (re-)use of 3D models by developing a multi-authoring approach to the addition of annotations and narratives, as well as side-by-side comparison of multiple models, within an online app environment adapted from the open-source Voyager platform. In addition to the data enrichment options of the built-in annotation system, the platform will be expanded by allowing linkage to datasets (e.g., thesauri and museum catalogues) available as Linked Open Data (LOD).

Two heritage-based case studies – production traces on experimental ceramics from the Tracing the Potter's Wheel (TPW) project and a drone-based dataset from the 4D Research Lab (4DRL) – will allow full exploration of diverse 3D models for the implementation and testing of the adapted Voyager environment.³ 3DWorkSpace will be tested and evaluated in both educational and research environments to collect experience for its implementation. Learning Pathways, using the Voyager annotation feature, will train users in the skills necessary for guiding analysis of the 3D models.

Researchers, teachers, students, and conservators alike will be able to create their own version of a 3DWorkSpace on computers, smartphones or tablets that can subsequently be linked to publications, websites, and classroom presentations. Importantly, 3DWorkSpace utilises existing open access resources to realise a truly open science platform: from adaptation of the Voyager tool suite, and testing with web-based open access 3D datasets, to technical support for data creation and access via Linked Open Data and Figshare.

About the authors

3DWorkSpace is a collaborative project between the Amsterdam Centre for Ancient Studies and Archaeology (ACASA), 4D Research Lab and CREATE, all of the Universiteit van Amsterdam (UvA), with the Open Universiteit(OU).

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Endnotes

- 1 Developed by the Smithsonian Institution (SI), <https://virtualinteriors.si.edu/presentation/> (<https://github.com/dpo-voyager/>) and Dynamic Collections
- 2 Examples include Virtual Interiors (<https://www.darklab.lu.se/digital-collections/dynamic-collections/>).
- 3 See <https://tracingthewheel.eu/database/> and <https://4dresearchlab.nl/drones/>.



Figure 1. The 3DWorkSpace logo (figure authors)