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Libraries and 3D Modeling: Supporting Humanities Scholars Working with 3D

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Lynn Cunningham • Hannah Scates Kettler
Research Lifecycle

PLANNING
- Grants & RDM plans
- Skills development
- Search for & collect preliminary assets

RESEARCH
- Organize assets
- Describe assets (metadata)
- Analyze assets

PRESERVATION
- RDM
- Store properly
- Migrate to sustainable formats

PUBLISHING
- Deposit & share work
- Publish to open access
- Make assets discoverable
Current support for 3D

<table>
<thead>
<tr>
<th>Service</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>3D printers &amp; Maker Spaces</td>
<td>84%</td>
</tr>
<tr>
<td>Training &amp; workshops</td>
<td>55%</td>
</tr>
<tr>
<td>Assistance finding 3D content</td>
<td>31%</td>
</tr>
<tr>
<td>3D data management</td>
<td>26%</td>
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</tbody>
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3D Printing Services

The NDSU Libraries provide 3D printing as a drop-off service at the Main Library for NDSU students, staff, and faculty. 3D printing is an additive manufacturing process in which a three-dimensional object is built by laying down successive layers of thin material.
Growth areas in support for 3D

- 3D printers: 11 (64.7%)
- Labs/Makerspaces: 10 (58.8%)
- VR stations: 8 (47.1%)
- 3D data management: 9 (52.9%)
- Metadata/paradata: 8 (47.1%)
- Training/workshops: 11 (64.7%)
- Help finding 3D content: 12 (70.6%)
- Acquiring 3D data sets: 10 (58.8%)
- Hosting models in OPAC: 1 (5.9%)
3D Repositories
St. Kevin’s Church
The Discovery Programme has prepared a case study of their digitisation of St. Kevin’s Church, which is the only stone-roofed building to survive at Glendalough and was originally a small rectangular single-chapel church with a minaret round tower belfry at the W end. A later chancel and sacristy were added at the E. The digitisation was completed as part of the 3D Icons project using Terrestrial Laser Scanning - the image shows the dense point cloud model produced in this process.

Griphomosqula
The University of Jaen, Andalucia Centre for Iberian Archaeology (UJA-CIA) has produced a case study of their digitisation of the Griphomosqula, a sculpture belonging to the group of Cerrillo Blanco (Porcuna, Jaen). Given the importance of the sculptures of Cerrillo Blanco, UJA-CIA aimed to obtain 3D models using the most appropriate methodology in terms of time, quality and the end use of the models. The main problems we faced were the lighting conditions, the complex morphology of the sculpture and the location in the museum on raised platforms with limited space around. Given the limitations, UJA-CIA decided to use self-positioning laser scanning as the most appropriate method for data capture.

Ladislau Hunyadi’s marble sarcophagus
The Muzeul National de Istorie a României (MNI) has created a case study of its digitisation of the Sarcophagus of John Hunyadi (brother of Tamás Hunyadi, a Hungarian noble and knight的大名) from the House of Hunyadi, who died in 1442), which is located in Saint Michael Roman Catholic Cathedral in Alba Iulia, Romania. The capture was completed using Image-Based - Structure from Motion (SfM) & Traditional Photogrammetry, a low-cost technique suitable for a museum.

Saint Laurentius church
Visual Dimension bvba has prepared a case study of 3D modelling which was completed based on the results of the excavations in the Saint Laurentius church (1992-2002). Together with the excavation results detailed
REACH A GLOBAL AUDIENCE BY PUBLISHING ON MULTIPLE PLATFORMS

ON CHROMECAST BACKDROP

Show images from your collection as the rotating background on TVs or large displays with the Chromecast media streaming device.

ON THE CHROME BROWSER

Share your beautiful artworks with millions of users through their Chrome browser every time they open a new tab.

ON CARDBOARD

Use Virtual Reality to present cultural locations through a curated immersive experience, as if you were actually there.

IN GOOGLE NOW

When travelling near your museum, Google Now users see a card showing a highlight of your collections. By clicking on the card, the user can get directions to your museum, or learn more about the artwork on the Cultural Institute site.
3D Publishing Platforms
Digital Applications in Archaeology and Cultural Heritage (DAACH) is an on-line, peer-reviewed journal in which scholars can publish 3D digital models of the world’s cultural heritage sites, monuments, and palaeoanthropological remains accompanied by associated academic articles.

The journal aims both to preserve digital cultural heritage models and to provide access to them for the scholarly community to facilitate the academic debate. DAACH offers scholars the opportunity of publishing their models online with full interactivity so that users can explore them at will. It is unique in that its focus is on the application of 3D modeling to cultural heritage. DAACH will provide full peer-review for all 3D models submitted to it. Pre-publication copies of all models will be freely available online.
Hydra/Fedora Mellon Project

“Building a Hosted Platform for Managing Monographic Source Materials”
Interim Report – Year 1

1. Summary of the Project

In March 2015, University of Michigan Press received $899,000 from the Andrew W. Mellon Foundation for a project entitled “Building a Hosted Platform for Managing Monographic Source Materials.” The proposal was for a suite of activities to be conducted over a period of three years (April 1, 2015 to March 31, 2018) with the end deliverable being a publishing platform built on the Hydra/Fedora framework, to be made available open source reuse as well as in the form of a hosted for-fee solution. While in the short term the primary application of the platform is to address the “companion website” problem (an increasing demand from authors for a way of presenting research data alongside their books), in the longer term it will also provide the infrastructure to enable long form presentations of digital scholarship (the monographs of the future) to be published. The Hydra/Fedora framework has become popular among large research libraries building data repositories and other content management solutions, and the proposal leverages the developing relationship between libraries and university presses to further their joint goal of better serving the digital scholarship needs of faculty. To provide a proof of concept and keep platform development grounded in real-world needs, five case studies will be published on the platform during the project from Indiana University Press, University of Michigan Press, University of Minnesota Press, Northwestern University Press, and Press fleeting University Press. Charles Wellington, Director of University of Michigan Press, and James Maron, Director of Press fleeting University Press, will serve as the co-principal investigators for the project.
3D Viewers
International Image Interoperability Framework (IIIF)

Open-source image standard for allowing image interoperability between collections around the world

Image API

Unlock assets and archival material as linked data
Immersion Humanites Viewer

What if instead of reading a description of an Egyptian sarcophagus, you could literally grab information from the object itself? The Immersive Humanities Viewer is a web viewer for three-dimensional models of historical objects that allows users to tag them with rich cultural data, and to see annotations that others have provided. Dave Willeke, and their partners believe that this interface will increase the visibility of historians’ work by making the experience of interacting with an object, or at least a model of an object, an intriguing search for information with many different paths to discover. Since users will be able to define their own data schema, queries can be either straightforward (show me all swords longer than 1.20 m) or complex (show me all coffins that have Book of the Dead spell 15 on the upper half of the lid).

CDH’s Lead DH Programmer, Dr. Dave Shepard, is one of the Principal Investigators of this project, along with Prof. Willeke Wendrich, CDH’s director. Anthony Caldwell, CDH’s lab manager, is contributing his modeling expertise. The faculty team also includes Egyptian coffin experts Kara Cooney (UCLA Near Eastern Languages and Cultures), whose initial attempt to build a database of coffins provided the main inspiration for the project, and Rita Lucarelli (UC Berkeley), whose work on how the Egyptian Book of the Dead was adapted to artifacts will be used as one of the first demonstrations of the viewer. All together, CDH staff are contributing project planning expertise, software prototyping and development expertise, and grant-writing expertise to the project.
Preservation
Preserving Virtual Worlds

Lead Partner: University of Illinois at Urbana-Champaign, Graduate School of Library and Information Science
Additional Partner: University of Maryland, Stanford University, Rochester Institute of Technology, Linden Lab

Interactive media are highly complex and at high risk for loss as technologies rapidly become obsolete. The Preserving Virtual Worlds project will explore methods for preserving digital games and interactive fiction. Major activities will include developing basic standards for metadata and content representation and conducting a series of archiving case studies for early video games, electronic literature and Second Life, an interactive multiplayer game. Second Life content participants include Life to the Second Power, Democracy Island and the International Spaceflight Museum.

Objectives

- Develop basic standards for metadata and content representation
- Investigate preservation issues through a series of archiving case studies representing early games and literature, as well as later interactive multiplayer game environments

More detailed project information can be found at the Project Web site.

Highlights

- Paper: Preserving Virtual Worlds Final Report (PDF, 21.94MB)
- Presentation: July 2008 Partner Meeting (PPT, 4.79MB)
Closing remarks