An Ontology for 3D Visualisation of Cultural Heritage

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MAIN ISSUE: 3D VISUALISATIONS TEND TO BE COMPLETELY OPAQUE

3D Visualisation of the House of the Tragic Poet in Pompeii. MAV, Herculaneum
IF YOU WERE IN A LIBRARY...

*THE KING’S LIBRARY, ENGRAVING BY RICHARD REEVE AFTER A DRAWING BY JAMES STEPHANOFF. COPYRIGHT GETTY*
PRINCIPLE 4

SUFFICIENT INFORMATION SHOULD BE DOCUMENTED AND DISSEMINATED TO ALLOW COMPUTER-BASED VISUALISATION METHODS AND OUTCOMES TO BE UNDERSTOOD AND EVALUATED IN RELATION TO THE CONTEXTS AND PURPOSES FOR WHICH THEY ARE DEPLOYED.
WHY THERE ARE NOT MANY DOCUMENTED 3D VISUALISATIONS?

DOCUMENTATION FOR 3D DIGITAL VISUALISATION IS:

- *(Really)* Long and time consuming
- Too verbose
- Not standardised
- Not easily searchable
THERE IS HOPE?

CAN WE THINK OF A FASTER, NOT EXPENSIVE, ACCESSIBLE, SEARCHABLE, STANDARDISED WAY TO EXPRESS INFORMATION ABOUT THE VISUALISATION, MAKING IT A PROPER PIECE OF ACADEMIC RESEARCH? CAN WE DESCRIBE THE ELEMENTS OF THE MODEL, THEIR RELATIONSHIPS WITH THE ACTUAL REMAINS, THE DOCUMENTS AND THE LITERATURE?
LINKED DATA AS A POSSIBLE APPROACH

Instance linkages within the linking open data datasets. Source: wikipedia
A TASTE OF LINKED DATA

- NICCOLINI’S DRAWING
- PRESUHN’S DRAWING
- ORPHEUS’ FRESCO
- DIGITAL RESTORATION A
- DIGITAL RESTORATION B
- DELLA CORTE’S EXCAVATION’S RECORDS
- VV

- HAS BIBLIO REFERENCE
- HAS DIGITAL COPY
- HAS URL

- DEPICTS
- HAS SOURCE
- DESCRIBES

- CITES
- HAS AUTHOR
- GREAT AUTHOR

- HTTP://WWW.POMPEIIINPICTURES.COM/ R6/6%2014%2020%20P9%20FILES/IMAGE011.JPG

- PRESUHN E., 1878. POMPEJI: DIE NEUESTEN AUSGRABUNGEN VON 1874 BIS 1878. LEIPZIG: WEIGEL. (III, PLATE VI)
DO WE REALLY NEED A NEW ONE?

WHAT MAKES THIS NEW ONTOLOGY DIFFERENT FROM THE MANY OTHERS THAT ALREADY EXIST?

- Not material object oriented,
- Not only qualities and relationships of the object (material or digital), but also the methodology used by the modellers and their interpretations of the available information.
S.C.O.T.C.H. : A COMMUNITY DEVELOPED ONTOLOGY

SEMANTIC COLLABORATIVE ONTOLOGY FOR THREE-D VISUALISATION OF CULTURAL HERITAGE
BREAKING (VIRTUAL) REALITY INTO PIECES
BREAKING (VIRTUAL) REALITY INTO PIECES
BREAKING (VIRTUAL) REALITY INTO PIECES
BREAKING (VIRTUAL) REALITY INTO PIECES
BREAKING (VIRTUAL) REALITY INTO PIECES
How Ancient History Encyclopedia linked up with Pelagios

We're back for some information on how we linked Ancient History Encyclopedia to Pelagios. I hope that this can be of help for future websites that join this excellent project.

First of all, we need to explain how AHE works. The website is entirely based on tags / keywords. Each tag has one (and only one) definition associated to it, and many possible articles, illustrations, or timeline events. It is possible -- and indeed necessary for the website to work properly -- that articles, illustrations, and timeline events are linked to many tags. An article on "Trade in Ancient Greece" would be tagged with "Greece", "Economy", "Trade", "Colonization", and it would subsequently be listed under all those tags' pages.

Now the initial idea was easy: Let's link up every geographical tag of ours (cities, countries, regions) to its equivalent location in Pleiades. We've got 2,400 tags, and we expect to have many more in the future, so we didn't want to do this all by hand. Instead, we wanted something future-proof, that would notify us automatically of possible matches between tags and Pleiades locations.
URIS FOR ANCIENT BUILDINGS

HTTP://PLEIADES.STOA.ORG/PLACES/638753/ODEON
PHOTOGRAPHS (AND 3D VISUALISATIONS?)

Explore / Tags / pleiades:*="638753

Sort by:
Most recent • Most interesting

Related tags:
pleiades:depicts=,
pleiades:findspot=,
pleiades:place=,
pleiades:origin=,
pleiades:where=,
pleiades:places=,
pleiades:atteststo=,
pleiades:observedat=,
pleiades:depicts=,
pleiades:findspot=

From Chris Ruggles
From Chris Ruggles
From Chris Ruggles

HTTP://WWW.FLICKR.COM/PHOTOS/TAGS/PLEIADES:*="638753
HOW CERTAIN YOU ARE ABOUT YOUR CERTAINTY?
(AND DOES IT REALLY MATTER?)
The material referent of the digital element still exists, and its dimensions and/or position are available as measurements.
SUPERIMPOSITION OF THREE PLANS OF THE ISEUM IN POMPEII:
SAINT-NON, PIRANESI, SOANE
The material referent does not exist anymore or has been subsequently modified, but it has been documented in the past and the documentation is still available.

DEPREZ, Louis Jean, Temple of Isis with Protective Covering at Pompeii, undated, black ink, grey wash and watercolour, National Museum, Stockholm.

PIRANESI, View of the Temple of Isis, which today exists among the remains of the ancient city of Pompeii
The material referent does not exist anymore but information can be derived from material clues.
**SOURCETYPE: DELTA**

The material referent does not exist anymore and it has not been documented, but it can be visualised according to well accepted standards, precedents or previous scholarship.

**SUB-TYPE: SIMILARITY**

the triple will then point at the object(s), either still existing or survived in documentation, that are suggested to be a relevant precedent. They will be identified through name, spatial coordinates, historical and contemporary documentation or museums' catalogues.
FRANCESCO PIRANESI'S ILLUSTRATION FOR THE BOOKS OF ARCHITECTURE BY VITRUVIUS
The triple will point at a bibliographical reference, and to its digital copy if available.

Francesco Piranesi, elevation for the Temple of Isis in Pompeii
The material referent does not exist anymore, but it can be visualised according to the researcher’s experience, knowledge, or intuition.
The digital element has been added for contextualisation and communication purposes. The element has not been created for scholarly purpose and does not aim to historical accuracy. However, some characteristics of an historical referent can still be recognised.

North wall of the ekklesiasterion: three different sources for the same element

Photos from pompeiiinpictures.com
The height of the main door of the temple
The roof of the ekklesiasterion

Francesco Piranesi’s rear elevation and transection for the Temple of Isis in Pompeii. Table du second Volume des antiquités de Pompeia.

Author’s picture of the scale model of the Iseum exhibited at the Archaeological Museum of Naples
SOURCES ARE HIDDEN

Common simplifications that often go undocumented. Elements of a series: the colonnade

Photos from pompeiiinpictures.com
Elements of a series: the arches of the ekklesiasterion’s entrance

hasWidth: 162
isNormalised: average of 4 (159/164)
hasVariation: 3%
LINKING ARTEFACTS
A simple, multiauthored digital unification

Photo from pompeiiinpictures.com
Temple of Isis (Catalogue)

Italiano: In una sezione del Museo Archeologico sono raccolti gli affreschi e gli oggetti ritrovati nel Tempio di Iside scoperto e scavato nell'antica città di Pompei a metà del XVIII secolo.
Author’s photographs of extant frescoes superimposed upon Chiantarelli’s drawing of south wall
AN ONTOLOGY FOR 3D VISUALISATION WOULD:

- constrain the documentation, creating a standard,

- speed up the recording process thus reducing time/cost and making the documentation more likely to be retained in a project,

- allow and encourage comparison of different visualisations and interpretations of ancient heritage,

- contribute to transform 3D visualisation from univocal display of traditional research to a collaborative virtual environment that can be shared and implemented by different scholars,

- allow citations and re-use of the visualisation of entire buildings or single elements and peer-review,

- make 3D visualisations (human- and machine-) searchable, connecting them with the literary and historical sources
THANK YOU FOR YOUR ATTENTION

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