



Abstracts Volume - 22nd International Conference on Cultural Heritage and New Technologies

Conference CHNT in cooperation with

- City of Vienna, Department for CULTURAL AFFAIRS
- City of Vienna, Department for AUTOMATED DATA PROCESSING, INFORMATION AND COMMUNICATIONS TECHNOLOGIES
- 7REASONS Medien GmbH

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Urban Archaeology and Integration

Combining archaeology, history, and new technologies

The aim of this conference is to enhance the collaboration between historians and archaeologists and related disciplines using new technologies and to showcase best practice applications in multidisciplinary research. The conference organizers invite sessions dealing with one of the following topics or a combination thereof:

- Application of effective 3D-methods for the reconstruction of buildings, integrating archaeological excavation data with historical sources including images, thus increasing our understanding of the past
- Additional digital methods for the combined visualisation of archaeological and historical data (e.g. monitoring changes and preservation of archaeological monuments based on historical images).
- Application of new technologies to assess the archaeological record based on historical data (maps, tax returns, inventories, ship wreck lists, etc.) and/or combining historical sources and archaeological data in a geographical information system for recording the history of urban or rural landscapes.
- Games, apps, and teaching software integrating archaeological and historical knowledge
- Historical data as a basis for checking or validating digital tools applied in archaeology and vice versa.
- Dealing with inscriptions (including cuneiform, hieroglyphs and symbols): digital methods for enhancing readability (e.g. Reflectance Transformation Imaging), pattern recognition of letters or pictograms, comparison of hand writing (same author?).
- Statistical analysis investigating the correlation between historical place names and archaeological evidence.

Scientific Committee

Content:

Advanced Archaeological Trainings

Training 1 – Integration of Archaeological, Historical and Surveying Data Documenting a Mining Landscape

Training 2 – Archaeological Geospatial Infrastructures - Searching, finding and using findings and their documentation with geospatial catalogues

Training 3 – Professional presentations

Round Tables

Round Table 1 - Interpreting Cultural Heritage during Conversion Projects

Round Table 2 – The Application of Games, Immersive Environments and Role-Playing in Cultural Heritage

Round Table 3 - Data model beyond the digital 3D model

Sessions:

Integrating historical maps and archaeological data using digital technologies

3D Documentation in Underwater Archaeology: Photogrammetry, Georeferencing, Monitoring, and Surveying

Cultural Heritage and Armed Conflicts

New Approaches to Medieval Structures and Space

New Realities 3: Virtual, augmented reality and ALL other techniques in Cultural and historical Heritage for the general public

Reflections and research on archaeological practices in the digital era

PhD / Master Session

3D digital reconstruction and related documentation sources

Adding life to written sources by studying the dead

The Employment of Mobile Applications for Survey, Documentation and Information

Poster Session

App Session

domestic roles following the Reformation, not least housing the city Armoury, State library and the city's first university. Subject to periods of extensive redevelopment, much of the complex was finally lost to the bombing raids of the Second World War and a traffic-widening scheme of the 1970s. Only a fragment now remains of the original claustal buildings, a multi-story car park erected on piloti rising overhead.

During its redevelopment, the site was cleared without archaeological investigation. Further, little scholarly research been conducted on the site to date. As such, any attempt to reconstruct the appearance of St Katharinen is now an act of inference: a process of archival archaeology. As part of ongoing work, we will present a new understanding of St Katharinen and the site's urban transformation across the centuries, one that draws together laser scanning and Lidar data with the most extensive body of construction, land registry, visual and textual data yet assembled.

3D GIS makes it possible for a variety of 2D and 3D data formats emerging from such work to be oriented within a single coordinate system, an important part of conjectural reconstruction activities. Such work, however, remains largely bound to desktop environments. The authors will propose how web-streaming 3D GIS tools such as Cesium may enable new forms of dissemination that can open research to a wider audience and capture the decisions lying behind reconstruction work.

Innovation:

In its use of diverse data sources, the project creates a platform to test 3D GIS dissemination tools that are only now beginning to emerge commercially.

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Using and combining remote-sensing technologies to document the Castillo de Consuegra in Castilla-La Mancha, Spain

Keywords: remote-sensing, castle, lasergrammetry, photogrammetry, documentation

Abstract:

The Castillo de La Muela in Consuegra, Castilla-La Mancha, Spain, is a medieval castle that has a long history starting from the Xth century. It is now one of the most well preserved castles of the region and it has undergone a lot of restoration campaigns.

A lot of questions are still not answered about this castle: it's the state of preservation and the various restoration campaigns need to be assessed and documented, the castle needs to be presented with new technics to the public in order to attract new visitors, and the surroundings of the castle and its lost outer surrounding walls have yet to be entirely found and documented.

In order to answer as many questions as possible, the castle was surveyed with remote-sensing technics by the CVASt from USF, Tampa, in collaboration with the Universities of Castilla-La Mancha and the Université Paris1 Panthéon-Sorbonne. The team used a lot of remote-sensing technologies to survey the castle and its surroundings: terrestrial laser scanning was used to document the exterior and interior of the castle; aerial photogrammetry by drone was used to document the upper parts of the castle and the whole hill on which it sits; terrestrial photogrammetry was used to document the inner parts of the castle, and 360 panoramas were made in order to create a virtual tour for the

visitors.

This survey will be included in a larger campaign using other remote-sensing technologies such as geophysics and aerial surveys using thermal imaging, but also well-known methods such as GIS and cartography will complete the new documentation in order to present all the new data to the public and contemplate an excavation campaign.

Relevance conference / Relevance session:

The survey campaign is about documenting Cultural Heritage in a remote area of Spain with new technologies, and how combining those to obtain the best of each would provide the best documentation.

Innovation:

Remote-sensing has been used before to document medieval structures, but rarely on a building this size and possibly never to that extent of precision and completion that the three surveys provided.

References:

1. Landes, P.Grussenmeyer, et all. Combination of terrestrial Recording Techniques for 3D Object Modelling regarding topographic constraints. Example of the Castle of Haut-Andlau, Alsace, France. XXlth CIPA International Symposium, 2007.
2. Guidi, F.Remondino, et all. A multi-resolution methodology for the 3D modelling of large and complex archaeological areas. Int. J. Architect. Comput. 2009.

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CITADEL—Computational Investigation of the Topographical and Architectural Designs in an Evolving Landscape

Keywords: Photogrammetry, Laserscanning, Maps, GIS

Abstract:

This interdisciplinary project spanning art history, archaeology, anthropology, history, computer science, remote sensing, and geoinformatics explores the implementation of multi-sensor data fusion integrating photogrammetry, laserscanning, GIS (Geographical Information Systems), and historical documents to establish a more holistic understanding of the effect of the landscape on medieval fortress design in the area of Kaiserslautern, Germany during the Middle Ages. The primary objective of the project is to derive the strategic and geopolitical reasoning for the construction of six defensive sites.

Throughout the known history of the Pfalz, the region has been consistently ravaged by war, suffering intense periods of scorched-earth tactics, depopulation, deforestation, industrialization and subsequent pollution. The project is using computational methods to determine the effect that the medieval landscape had on the design, position, and strategy of the test sites chosen at the Institut für Europäische Kunstgeschichte with assistance from the Insitut für Pfälzische Geschichte und Volkskunde. All of the sites will be modeled using photogrammetric and laserscanning techniques and linked into a digital landscape model based upon aerial laserscan (ALS) data with assistance from the GIScience research group. Contextual information derived from historical documents and maps with support from the HeiMAP project will create a more complete depiction of the medieval territory once