PARTHENOS

Pooling Activities, Resources and Tools for Heritage E-research Networking, Optimization and Synergies

Share — Publish — Store — Preserve. Methodologies, Tools and Challenges for 3D Use in Social Sciences and Humanities

25th-27th February 2019, Marseilles, FRANCE

Organization : **3D consortium for Humanities, CNRS-MAP/CNR-ISTI International Joint Lab, CNRS/Huma-Num, Inria**

Host : **CNRS-MAP**

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PRACTICAL **INFORMATION**

Address of CNRS-MAP
Campus CNRS Joseph Aiguier - Bât. US
31 chemin Joseph Aiguier
13402 MARSEILLE CEDEX 09

Organizers' contact
parthenos.3dws.orga@listes.huma-num.fr

TRANSPORTS TO GET TO CNRS-MAP

From Marseille Provence Airport
Take the bus 91 Marseille Centre towards Marseille Saint Charles (every 15 minutes).

From the train station Gare Saint Charles
Take the Metro M2 in the direction of "Sainte-Marguerite Dromel" and stop at the terminus. Then take the Bus 48 towards Clairval Vallon du Redon. Get off at "Aiguier CNRS" stop.

OR

Take the Metro M2 in the direction of "Sainte-Marguerite Dromel" and stop at "Rond Point du Prado" station.
Then take the bus B1 towards "Campus de Luminy" and stop at "Michelet Bonneaude". Walk along Chemin de la Bonnaude 650m.

RESTAURANTS

Les Arcenaulx
25 Cours d'Estienne d'Orves, 13001 Marseille
Metro M1, « Vieux Port – Hôtel de Ville » station

Bistrot O'Prado
1 Boulevard Périer, 13008 Marseille
Metro M2, « Périer » station

OBJECTIVES

After a 1st workshop « Digital 3D Objects in Arts and Humanities : Challenges of Creation, Interoperability and Preservation » held in 2016, the 3D consortium for Humanities on behalf of CNRS/Huma-Num, the CNRS-MAP/CNR-ISTI International Joint Lab and Inria organize a new workshop around 3D data within the scope of PARTHENOS Work Package 4 on standardization.

This second workshop will mainly be dedicated to interactive 3D data management tools, most of them developed by the organizers: how can we use them to handle 3D data ? How can they help to standardize practices? How can they be consolidated ?

More precisely, the objectives are to :

- Share general knowledge on 3D issues in Humanities and Social Sciences;
- Deepen technical knowledge about specific 3D tools;
- Contribute to a better understanding of technologies potential and users' needs;
- Confront practices and experiences and raise for discussion;
- Promote and contribute to best practices and standards to ensure 3D data interoperability and sustainability.

We have selected four main topics, corresponding to the life cycle and the various uses of 3D data in Humanities and Social Sciences: sharing, publishing, storing and preserving. For each topic, domain specialists will introduce the theme, the issues it deals with and specific tools addressing these issues. Then, throughout training sessions, participants will also be able to delve into tools presented by manipulating them with their own data.

The workshop will be attended by participants with various backgrounds selected with an open call. Indeed, we have aimed at including different disciplines, such as for instance archaeology, architecture, geomatics or computer graphics. The goal is to ensure to cover a wide range of use cases from different research communities.

This workshop will produce a white paper based on contributions from all the participants. The participants will also feed one of the output of the PARTHENOS project, the Standardization Survival Kit (SSK), through the creation of research scenarios.

PROGRAM

DAY 1 — 25th **FEBRUARY** 2019

09.00 - 10.00 REGISTRATION

10.00 - 10.30 **Introduction**

Adeline Joffres (CNRS/Huma-Num, PARTHENOS), Xavier Granier (IOGS – 3D consortium for Humanities), Livio de Luca (CNRS-MAP), Roberto Scopigno (CNR-ISTI, PARTHENOS), Dorian Seillier (Inria, PARTHENOS), Thomas Carlu (European Commission)

Goals of the Master Classes as a part of the PARTHENOS project, presentation of Huma-Num's 3D consortium for Humanities (host of the workshop), PARTHENOS and CNRS/CNR MAP-ISTI joint lab.

10.30 - 11.00 [PUBLISH] **PARTHENOS, Standards and Research Best Practices: the Standardization Survival Kit (SSK)**

Dorian Seillier (Inria, PARTHENOS)

The goal of the Standardization Survival Kit (SSK), developed within the PARTHENOS project, is to accompany researchers in order to stabilize knowledge on standards and good research practices, giving access to them in a meaningful way, by the mediation of research scenarios. A research scenario is a (digital) workflow practiced by researchers that can be repeatedly applied to a task that will help to gain material or insights in view of a research question. These scenarios are at the core of the SSK, as they embed resources with contextual information and relevant examples on standardized processes and methods in a research context. The SSK is an open tool where users are able to publish new scenarios or adapt existing ones. These scenarios can be seen as a living memory of what should be the best research practices in a given community, made accessible and re-usable for other researchers.

11.00 - 11.15 COFFEE BREAK

11.15 - 12.30 **Fast-forward**

Participants

Overview of participants' experiences, and expectations/challenges.

12.30 - 14.00 LUNCH TIME

14.00 - 15.00 [COLLECT & SHARE] **Aïoli : a Reality-based 3D Annotation Platform**

Livio de Luca (CNRS-MAP, 3D consortium for Humanities)

Archaeologists, architects, engineers, materials specialists, teachers, curators and restorers of cultural property, contribute to the daily knowledge and conservation of heritage artefacts. The management of multi-dimensional and multi-format data introduces new challenges, in particular the development of relevant analysis and interpretation methods, the sharing and correlation of heterogeneous data among several actors and contexts, and the centralised archiving of documentation results. Despite their different approaches and tools for observation, description and analysis, the actors of cultural heritage documentation all have a common interest and central focus: the heritage object, the physical one, whether it is a site, a building, a sculpture, a painting, a work of art, or an archaeological fragment. This is the starting point of Aïoli, a reality-based 3D annotation platform, which allows a multidisciplinary community to build semantically-enriched 3D descriptions of heritage artefacts from simple images and spatialized annotations coupled with additional resources. Developed by the CNRS-MAP Lab, this platform introduces an innovative framework for the comprehensive, large-scale collaborative documentation of cultural heritage by integrating state-of-the-art technological components (fully automatic image-based 3D reconstruction, 2D-3D spreading and correlation of semantic annotations, multi-layered analysis of qualitative and quantitative attributes, ...) within a cloud infrastructure accessible via web interfaces from PCs, tablets and smartphones online and onsite.

15.00 - 15.15 COFFEE BREAK

15.15 - 17.30 [COLLECT & SHARE] **Hands on Aïoli (training session)**

Adeline Manuel (CNRS-MAP), Anas Alaoui (CNRS-MAP)

By merging the presentation of features with the manipulation of real data, this training session allows participants to discover the aïoli platform, its potential uses, as well as the basic commands to collect, process, analyse, structure and share data.

19.30 DINNER AT **LES ARCENAULX**

DAY 2 26th **FEBRUARY** 2019

09.00 - 09.30 [VISUALIZE] **OpenSpace 3D for Onboard Visualization**

Bastien Bourineau (OpenSpace 3D)

OpenSpace3D is an open platform with a large range of uses. From a simple 3D model visualization to an advanced Augmented Reality or Virtual Reality application, OpenSpace3D will help you to study, evaluate, share and present to any public your work and concepts.

09.30 - 10.00 [VISUALIZE] **Applications Scenarios for CST3D Viewer**

Bastien Bourineau (OpenSpace 3D), Valentin Grimaud (CNRS-LARA, 3D consortium for Humanities)

This time we will focus on the model viewer template in OpenSpace3D that makes it possible to add visualization tools to your 3D models.

10.00 - 10.15 COFFEE BREAK

10.15 - 10.45 [VISUALIZE & PUBLISH] **From Local Visualizers to Web Publishing & Viz of 3D Data**

Roberto Scopigno (CNR-ISTI, PARTHENOS)

This presentation will review the recent technical evolution, from local visualization tools to remote visualization, the latter approach now operating inside standard Web browsers. The progress achieved (since the introduction of WebGL) means that efficient solutions nowadays exist to easily publish 3D models on the Web and to visualize them without the need for plugins or specific applications. Finally, we will introduce the specific needs of the CH domain with respect to 3D (Web) viewers.

10.45 - 11.15 [VISUALIZE & PUBLISH] **Introduction of 3DHOP**

Marco Potenziani (CNR-ISTI, PARTHENOS)

Nowadays 3D data are becoming more and more a key digital media. Since their accessibility is fundamental, 3D Web publishing is experiencing rapid and chaotic growth. Nevertheless the resulting panorama, despite the variety of approaches, reveals several shortcomings and "missing links": unsolved issues, uncovered users, neglected fields…
3DHOP (3D Heritage Online Presenter) is a software solution aimed at filling these empty spots. Developed by CNR as a publishing framework for the interactive visualization of complex 3D datasets online, it has been expressly designed for simplifying the creation of Web3D contents specifically addressed to the CH domain.

11.15 - 12.00 [VISUALIZE & PUBLISH] **3DHOP Applications**

Marco Potenziani (CNR-ISTI, PARTHENOS)

A number of applications (both developed by CNR and by third-

parties) will be presented and demonstrated. The aim is to show a quite complete set of use cases (different in complexity and application context), representative of the many different types of use and of web-based resources that can be designed and implemented using 3DHOP.

12.00 - 13.30 LUNCH TIME

13.30 - 15.00 [VISUALIZE & PUBLISH] **3DHOP (training session)**

Marco Potenziani (CNR-ISTI, PARTHENOS)

Starting from the simplest use of 3DHOP, and through the progressive adding of high-level presentation features, several examples of use of 3DHOP will be presented with a practical hands-on approach. This training session will allow participants to test the publishing framework on their own datasets, discovering the potential uses of 3DHOP, as well as the best practices for building an effective Web3D presentation.

15.00 - 15.15 COFFEE BREAK

15.15 - 15.45 [VISUALIZE, PUBLISH & STORE] **Visual Media Service**

Marco Potenziani (CNR-ISTI, PARTHENOS), Roberto Scopigno (CNR-ISTI, PARTHENOS)

Visual Media Service offers a very easy solution for publishing online different visual media (high-resolution 2D images, RTI, 3D models) and for visualizing them under a common framework.
Visual Media Service was developed by CNR, in the framework of the EC projects ARIADNE and PARTHENOS, and implemented on top of 3DHOP technology. It was designed as a service-oriented platform for assisting the deployment of Web presentations pivoted on complex visual media assets, the Visual Media Service is based on the 3DHOP and Relight technologies.
The presentation will introduce the design and the functionalities of the service, underlying its specific advantages (simplicity of use, performing multiresolution schemes to enable efficient data transfer on the internet and responsive and high-quality visualization, assisted presentation customization, etc.).

15.45 - 16.15 [VISUALIZE, PUBLISH & STORE] **Visual Media Service (training session)**

Marco Potenziani (CNR-ISTI, PARTHENOS), Roberto Scopigno (CNR-ISTI, PARTHENOS)

From the uploading of a single content to the customization of the final presentation. Some examples of use of the Visual Media Service will be presented, as well as a practical hands-on session. Finally, participants will also learn how to use this service-oriented platform in order to rapidly master use of the 3DHOP framework.

16.15 - 16.30 COFFEE BREAK

16.30 - 17.30 **Presentation of MAP's activities**

19.30 DINNER AT **BISTRO O'PRADO**

DAY 3 27th **FEBRUARY** 2019

09.00 - 09.30

[STORE & PRESERVE] Life Cycle of 3D Data for HSS & aLTAG 3D

Sarah Tournon-Valiente (CNRS-Archéovision, 3D consortium for Humanities), Valentin Grimaud (CNRS-LARA , 3D consortium for Humanities)

Under the supervision of the French national infrastructure for digital humanities (Huma-Num), the 3D Consortium has defined a life cycle of 3D data from creation up to archiving. We have formalized the different steps of the data life cycle. The first step consists in collecting data produced by capture devices (laser scanners, digital cameras, etc.). These data are denominated A0. The second step consists in processing the data (cleaning, meshing…) to create the initial models V0. Finally, new modelling can be added to include new hypotheses for the restitution. This step can be iterated creating V1n versions up to the V2 that is the final version. A supplementary step may be added when valorisation is considered. All the versions from A0, V0 up to V2 are candidates for archiving. We have formalized this process with a sequential graph that introduces a new metadata schema dedicated to the long-term archiving of 3D models for HSS. We have also created a software aLTAG 3D, that leverages the usual complexity of documentation to create metadata and of checking that the 3D files are suitable for archiving. It creates an archive that can be pushed to the CINES – the French national infrastructure for high-performance computing, and for long-term digital preservation.

09.30 - 10.30

[STORE & PRESERVE] aLTAG 3D (training session)

Sarah Tournon-Valiente (CNRS-Archéovision, 3D consortium for Humanities), Valentin Grimaud (CNRS-LARA, 3D consortium for Humanities)

After the presentation of the life cycle of 3D data as defined by the 3D Humanities Consortium, we will now discover how to set aLTAG 3D in production in order to archive 3D contents. This includes how to use the software, and how to manage data efficiently.
In order to use aLTAG3D, even though a data sample will be available, it would be better if every participant has his/her own dataset from a concrete project including 3D data.
During the session, people will download and install aLTAG3D and get used to the interface. Step by step they will discover every "box" of aLTAG3D, representing every part of the 3D data model used to gather information about the 3D project. They

will also learn how to create new "boxes" in aLTAG3D to get a complete archive, ready for a deposit. Another part of the session will be dedicated to discovering other functionalities of aLTAG3D such as validate a deposit or generate a report.
At the end of the session, participants will have a complete archive, validated by aLTAG3D, including xml files generated by the software.

10.30 - 10.45 COFFEE BREAK

10.45 - 12.30 [PUBLISH] **Creation of Standard Scenarios for the SSK (training session)**
Dorian Seillier (Inria, PARTHENOS)

In small groups, participants will develop standard scenarios based on case studies extracted from their experience and from the experience of the speakers, and document them via the SSK platform.

12.30 - 14.00 LUNCH TIME

14.00 - 15.00 [PUBLISH] **Restitution of Standard Scenarios (training session)**
Dorian Seillier (Inria, PARTHENOS)

Restitution of standard scenarios produced by the participants.

15.00 - 15.30 [PUBLISH & STORE] **the MEMORIA Project**
Iwona Dudek (CNRS-MAP)

Knowledge management systems are today part of many research protocols where they act as powerful means to share, use, organize and maintain knowledge and information. They remain however tricky to apply in the specific context of heritage science where workflows include a long tail of subjective human decisions, of non-explicit research protocols, of poorly formalised pieces of knowledge, of undocumented, non-reproducible, intuitive interpretations, etc. Yet the heritage science community has witnessed over the past decades the emergence of huge quantities of digital outputs, either following massive digitization efforts, or as a result of the growing capacity of actors to produce digital-born material. How can this move be supported in terms of reproducibility, reusability and cross-examination of results if research protocols remain non-formalised one-shot efforts?
The presentation will introduce a research program MEMORIA, aimed at experimenting a practical solution for the formalization and intersubjective description of research workflows. This initiative is based on the idea that, beyond metadata describing outputs themselves, the scientific community concerned is awaiting means to ensure their verifiability, reproducibility and comparability.

15.30 - 16.00 **Conclusion**

BRIEF BIO
OF SPEAKERS

Anas **ALAOUI M'DARHRI**

After graduating as a system architect and software engineer, and working in a macromolecular biology institute (CRBM), he joined the UMR MAP 3495 as the lead developer of Aïoli.
His main fields of interests are software-related, with a focus on genetic algorithmic and machine learning techniques.

Bastien **BOURINEAU**

R&D Manager, project manager and lead developer of OpenSpace3D Free software at I-Maginer. Self-taught with more than 20 years of experience in computer programming and 3D graphics.

Livio **DE LUCA**

Architect, PhD in engineering, HDR (habilitation) in Computer Science, Livio De Luca is research director at CNRS (French National Centre for Scientific Research) and director of the MAP (Models and simulations for architecture and cultural heritage) lab. He's also a member of the French National Committee for Scientific Research. Scientific advisor and member of several national (Culture3DClouds, ANR Monumentum, Fiat Lux, …) and international (3D-ICONS, MC_ITN-DCH, …) research projects, his research activity focuses on digital surveying, modelling and representation of architectural heritage as well as on the design and implementation of semantic-based information systems for describing, analyzing, documenting and sharing digital representations of heritage buildings. As member of international scientific committees and working groups for the digital documentation of cultural heritage, he served as general co-chair of the UNESCO/IEEE/EG DigitalHeritage international congress in 2013 (Marseille) and 2015 (Granada). He has been awarded the "Prix Pierre Bézier" of the "Fondation Arts et Métiers" in 2007 and the "Médaille de la Recherche et de la Technique" of the "Académie d'Architecture de France" in 2016.

Iwona **DUDEK**

Architect (Krakow's Technical University), PhD in History of architecture and urbanism – CNRS senior researcher at the MAP-Gamsau research team in Marseilles.
Her research focuses on building bridges between advances in the knowledge representation and InfoVis scientific communities and the specific nature of knowledge and information in Historical Sciences. Her research themes and involvements include knowledge modelling, history of architecture and urban forms, diachronic analysis of historic architecture, visual analytics as applied to historical sciences, time-oriented data/information management, spatio-temporal information systems, graphic semiology in the context of InfoVis techniques and tangible interfaces.
Iwona Dudek is the author and co-author of over 70 peer-reviewed publications on topics ranging from history of architecture to information management and InfoVis. She acts as a reviewer or international scientific journals and conferences, organised interdisciplinary scientific events, conducted or participated in research projects funded at national and international level at the intersection of historical sciences and computer science.

Xavier **GRANIER**

Professor at Institut d'Optique Graduate School (IOGS), Xavier Granier has a multidisciplinary research profile. His background is realistic rendering and global illumination extended to acquisition and modeling of material properties and light sources (starting at University of British Columbia - Vancouver - Canada), sketching interactions (with Zheijiang University - Hangzhou - China) and expressive rendering (previously called non-photorealistic rendering). Currently, is orienting is research in two directions. First one is the creation of new 3D technologies that combine the strengths of optics and computer graphics. For this purpose, he has created the Inria team-project MANAO and creating research group an teachings for IOGS. The second one is the development of these technologies as tools for studies, preservation and diffusion of Cultural Heritage.
For this purpose, he serves as scientific director of Archeovsion and coordinates the Consortium 3D for Humanities. His track record contains high level publications and participation to program committees in Computer Graphics but also publication in Optics and, Computing and Cultural Heritage. He is regular reviewer of publications in all these domains.

Valentin **GRIMAUD**

Architect-archaeologist, Valentin Grimaud is working at the University of Nantes, at the Laboratoire de Recherche en Archéologie et Architectures (LARA). He is specialized on the 3D documentation of rock art and Neolithic monumental funerary architectures. He also participates in the Consortium 3D SHS (on the topic of archiving 3D models).

Adeline **JOFFRES**

Adeline Joffres is a research engineer, head of International Cooperation within the TGIR Huma-Num (CNRS). In particular, she works on the internationalisation of the TGIR's consortia. She is involved in the French coordination of the European research infrastructures DARIAH and CLARIN as well as the coordination of H2020 projects such as PARTHENOS. She is also working on the development of cooperation links between TGIR Huma-Num and Latin America as well as with French higher education and research institutions abroad.

Adeline **MANUEL**

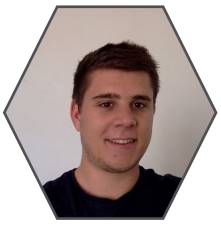
Adeline MANUEL is researcher at CNRS in the MAP (Models and simulations for architecture and cultural heritage) laboratory. After a master pursued in Information and System Science at the MAP laboratory in 2012, she received her PhD at the Arts et Métiers ParisTech in 2016. Her research activities focuses on specific problems of information visualization, spatialization of information, 2D/3D linking, automatic propagation of annotations and 2D/3D analysis tools. She currently develops Aioli, an application for describing, analyzing and documenting cultural heritage based on these research topics.

Marco **POTENZIANI**

Master of Engineering (University of Siena), Ph.D. in Computer Science (University of Pisa), Marco is a Computer Graphics specialist. He currently works at Visual Computing Lab (CNR-ISTI). Participated in several international research projects concerning 3D data interactive visualization, web applications design, and Digital Humanities.

Roberto **SCOPIGNO**

Roberto Scopigno is Research Director at CNR-ISTI with 30 years of experience on 3D graphics (3D digitization, visualization, geometry processing) and its application to the Cultural Heritage domain. He is author of more than 250 international papers, with Google Scholar h-index 51 and more than 11,000 citations. He participated with several EU and national research projects concerned with ICT and Cultural Heritage. Roberto served in the Eurographics Association (served as General Chair 2009-2010), was Chief Editors of international Journals (Computer Graphics Forum and ACM Journal of Computing and Cultural Heritage) and was the organizer of several international events (Eurographics'99, Eurographics2008, Digital Heritage2015, CAA2015, Visual Heritage2018).



Dorian **SEILLIER**

Master's degree in Medieval History and in Information Architecture at the ENS de Lyon. Currently a member of the Team ALMAnaCH at Inria Paris, where he works as a UX Designer / Information Architect for the SSK (PARTHENOS project).

Sarah **TOURNON-VALIENTE**

Software Engineer, Archeovision UMS3657, CNRS.
Formerly specialized in databases administration and migration for private telecom firms. Now acting in research databases, specialized in database management, software development and interoperability.

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NOTES

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