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3D as a Service for Cultural Heritage

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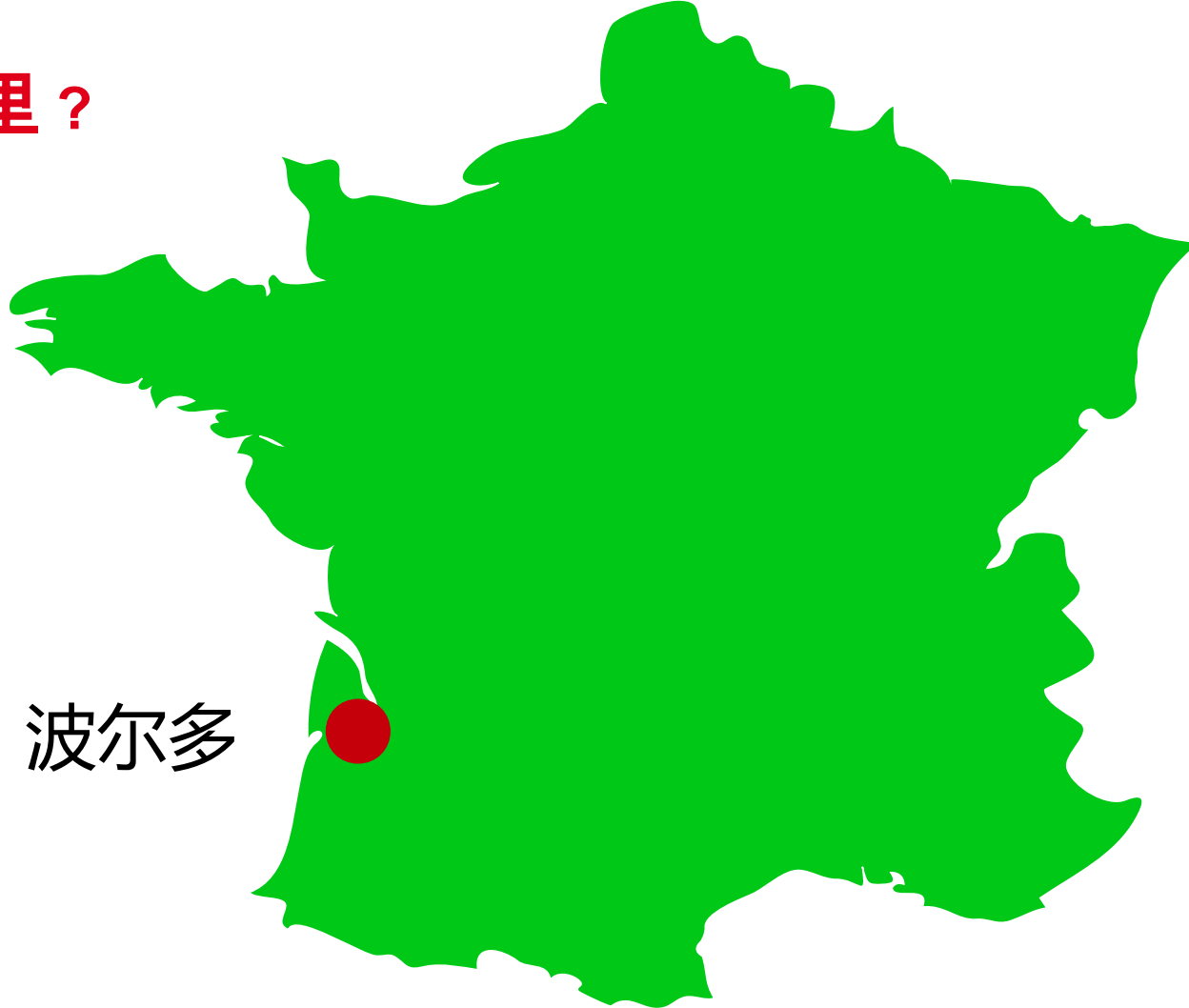
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3D as a Service for Cultural Heritage

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我们在哪里？



波尔多

法国

Scientific Context

- Optic
 - Professor @ IOGS
 - Member of LP2N
 - Since 2012
- Computer Graphics
 - Head of MANAO team
 - 2011 – 2018
- Archeology
 - Archeovision
 - Scientific Director
 - 3D Constortium
 - Coordinator
 - Since 2017

3D for Cultural Heritage

- How to acquire
 - Still some progresses for geometry
 - Challenges for Appearance
- How to analyze
 - Extract important structures
- How and What to visualize
 - Rendering styles
 - Tools for archaeologist
 - Tools for museum
- How and What to archive

1

Acquire

Unpublished – New device for acquisition



With IFAO – Imaging in cervices – Medamoud temple – Egypt

En cours – acquisition d'apparence

- Very Large collection
 - Clothes from Asia
 - XIXth century
- Difficulty to expose them
 - Too fragile
- Goal of the collaboration
 - Create an exhibition
 - Original or actual state



Robe - Fish skin - painted et sewn

Vietnam – Woman Cloth



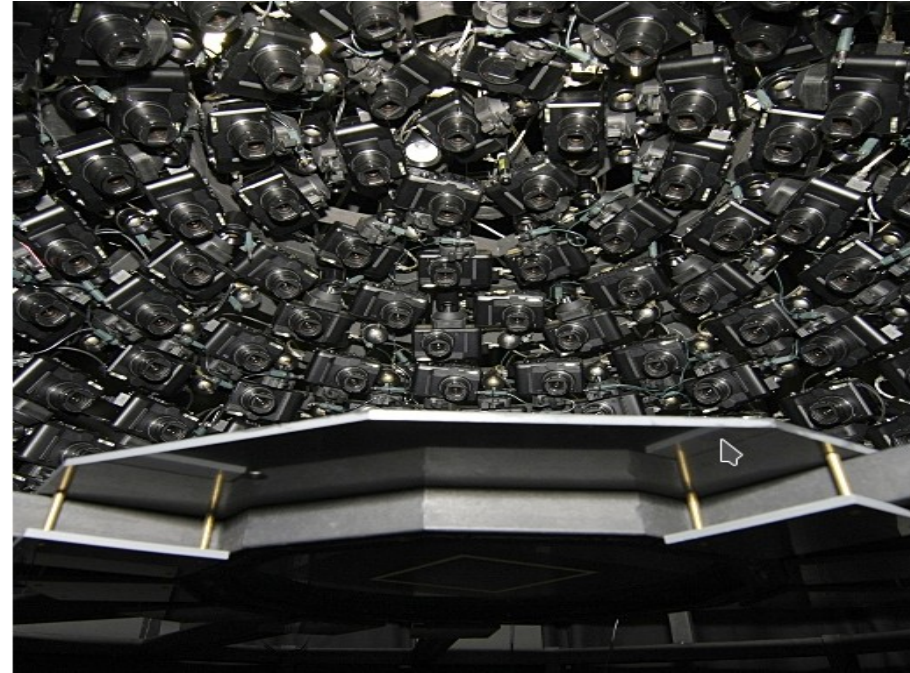
MEB | MUSÉE D'ETHNOGRAPHIE
DE L'UNIVERSITÉ DE BORDEAUX



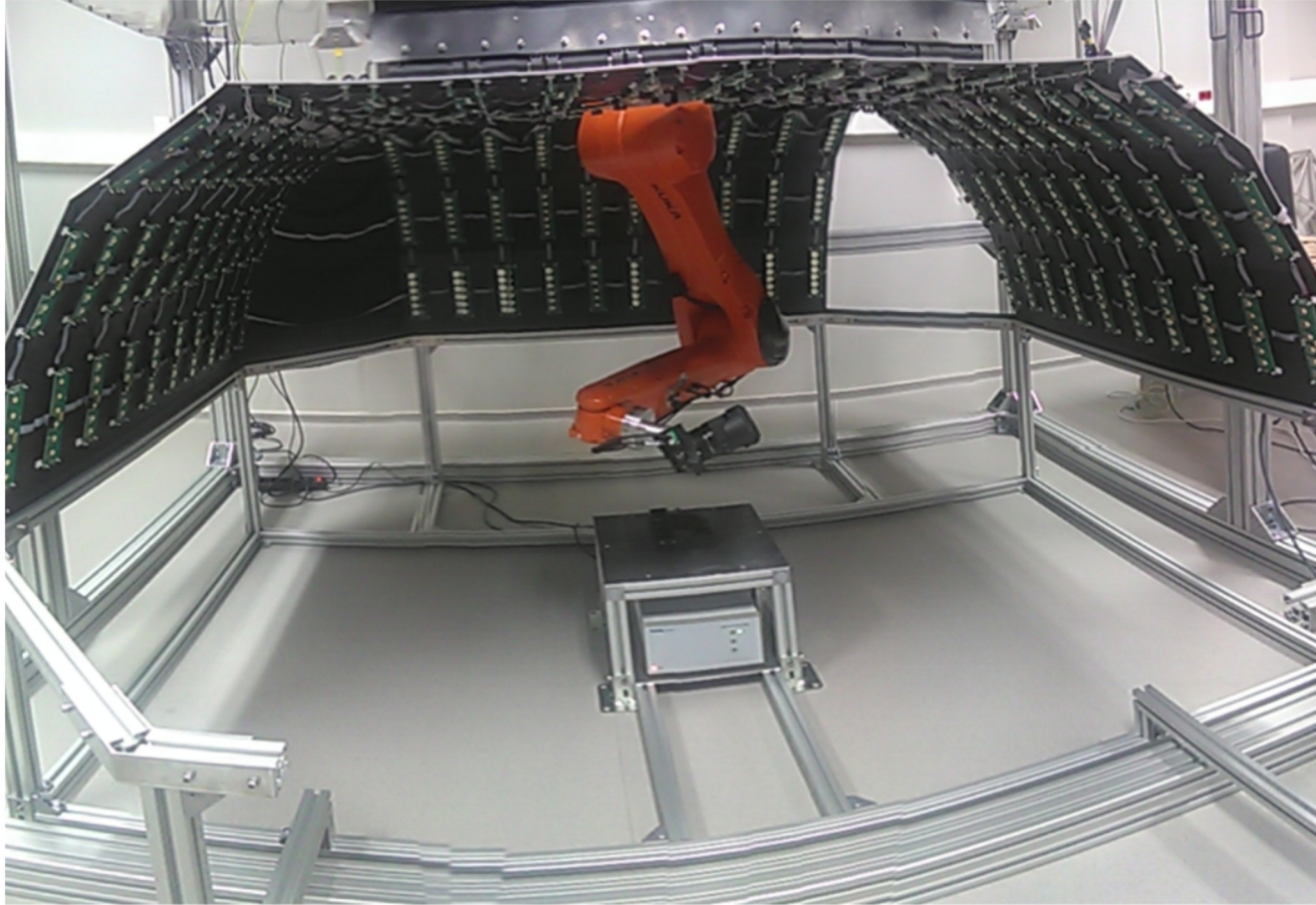
New acquisition platform

- Prev. : *Integrated High-Quality Acquisition of Geometry and Appearance for Cultural Heritage*
 - Schwartz, Weinmann, Ruiters, and Klein
 - VAST 2011
- Scan whole clothes
 - > 1000 LEDS
 - 3D Scanner
 - Robot arm

<http://btf.cs.uni-bonn.de/viewer/>



Current status



2

Analyze

Illustrative Shading



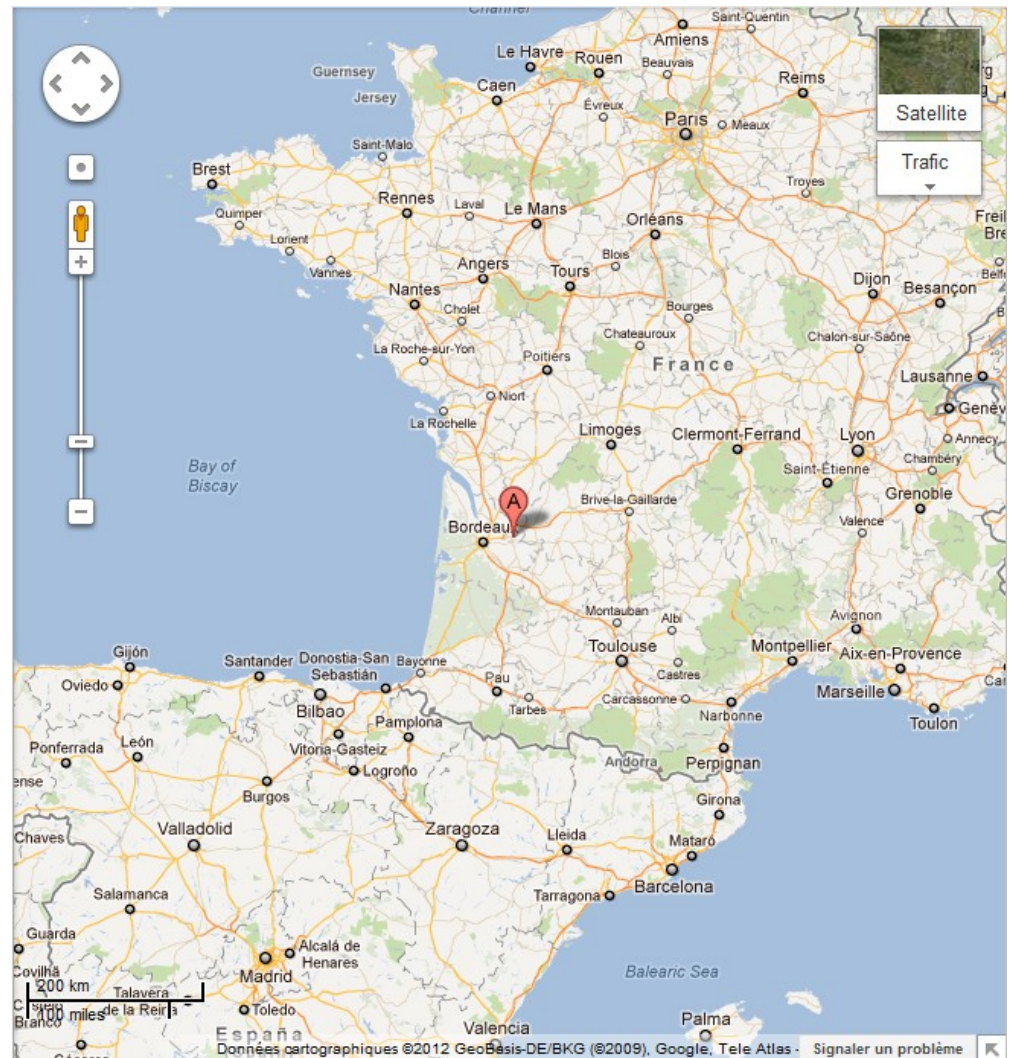
Classical Phong Shading



Illustrative Material

3D model of d'Isis (d'Alexandria Lighthouse)
Acquired by **CEAlex** & **Archéovision**

Epitaph of St. Emilion



Epitaph of St. Emilion

- Discovered between 1934 and 1951
- Oldest written trace of St Emilion relics ?



Frédéric Boutoulle (Univ. Bordeaux, CNRS)
Pascal Mora (Archéovision, Univ. Bordeaux, CNRS)
Romain Vergne (Inria, Univ. Bordeaux)

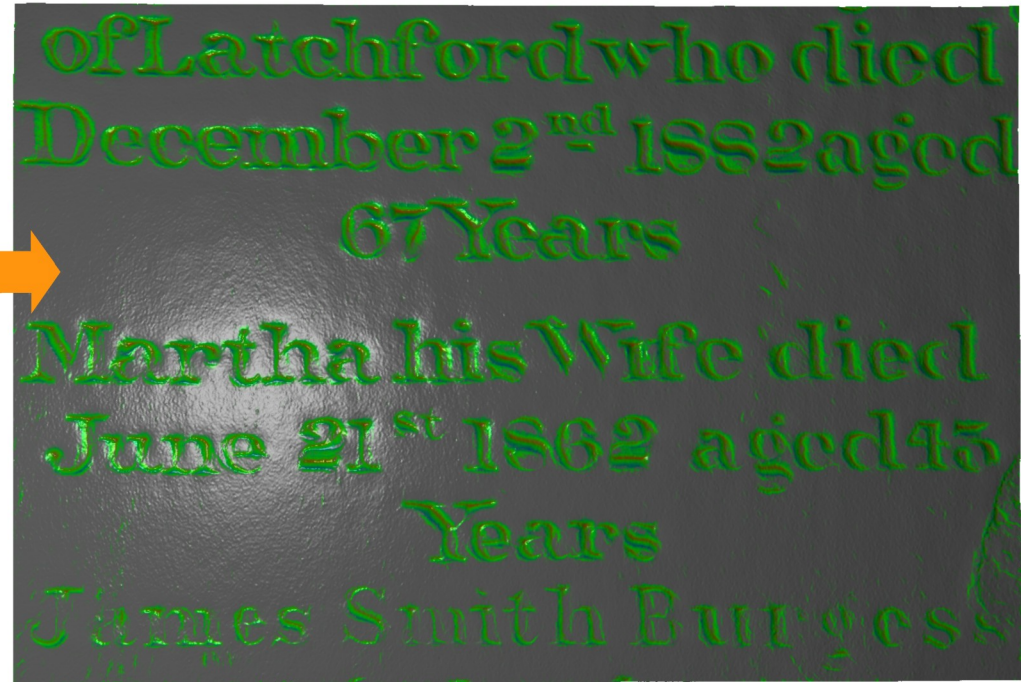
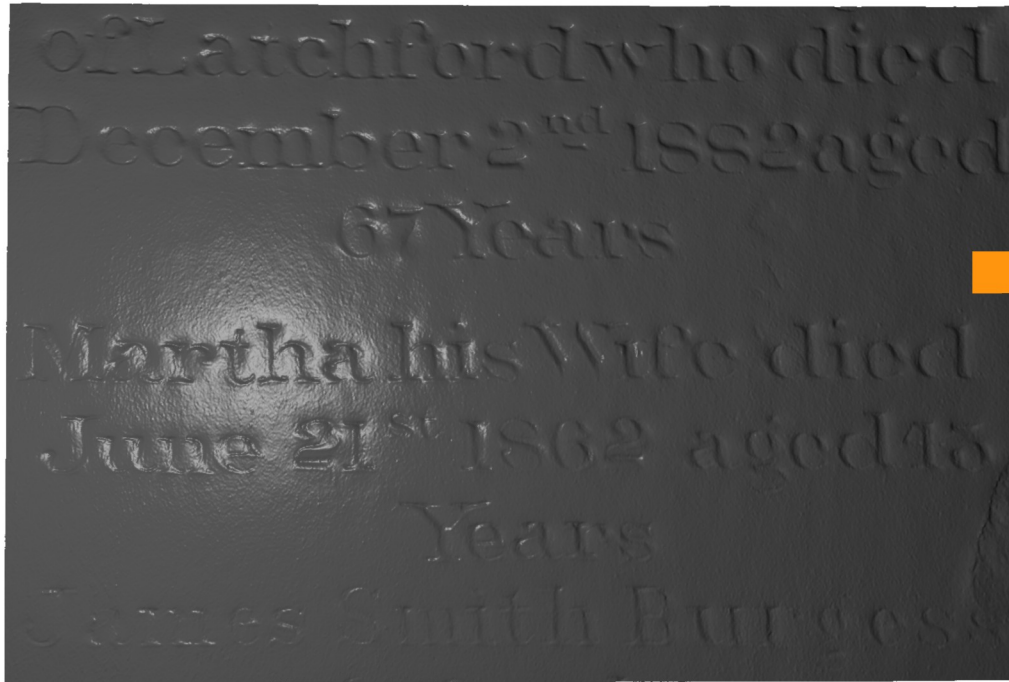


Epitaph of St. Emilion



Taking into account scale + filtering

For Digital Squeeze



Taking into account scale + filtering

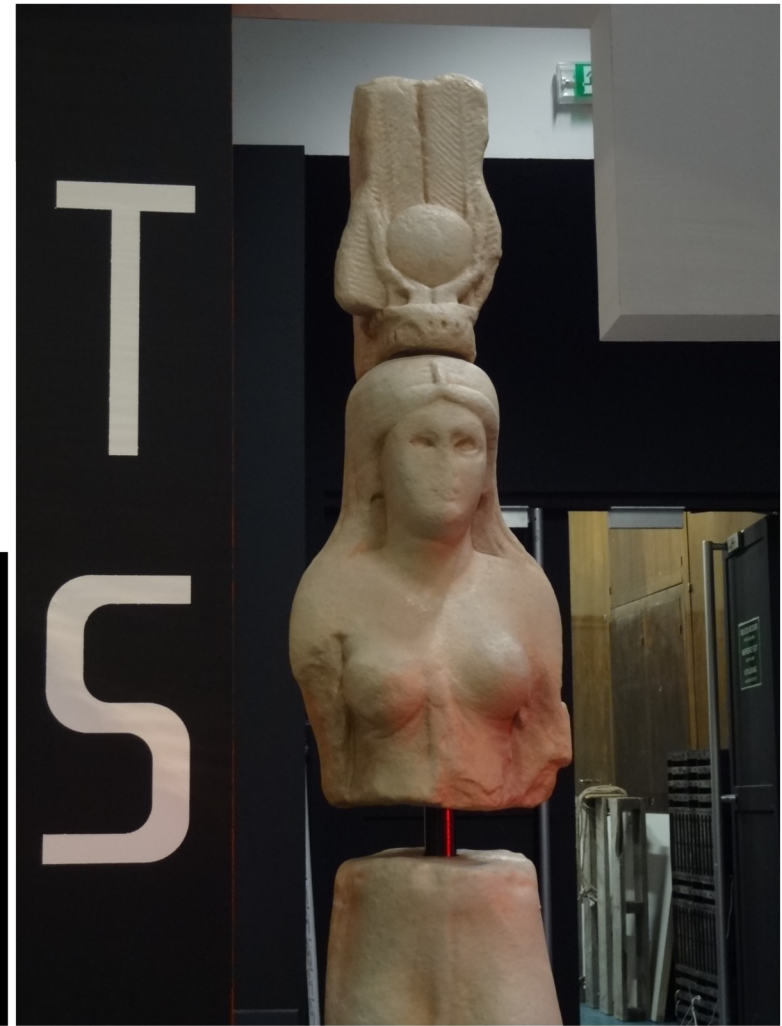
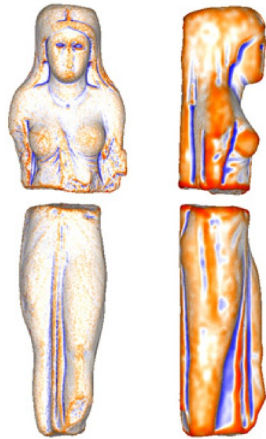
L. Amman, P. Barla, G. Guennebaud, X. Granier & P. Reuter
CGF 2012



3

Visualize

Ex : Maritime museum (Paris)



Spatial Augmented Reality

- From Prototype to museum
 - Real world as display support



Spatial Augmented Reality

- From Prototype to museum
 - Real world as display support

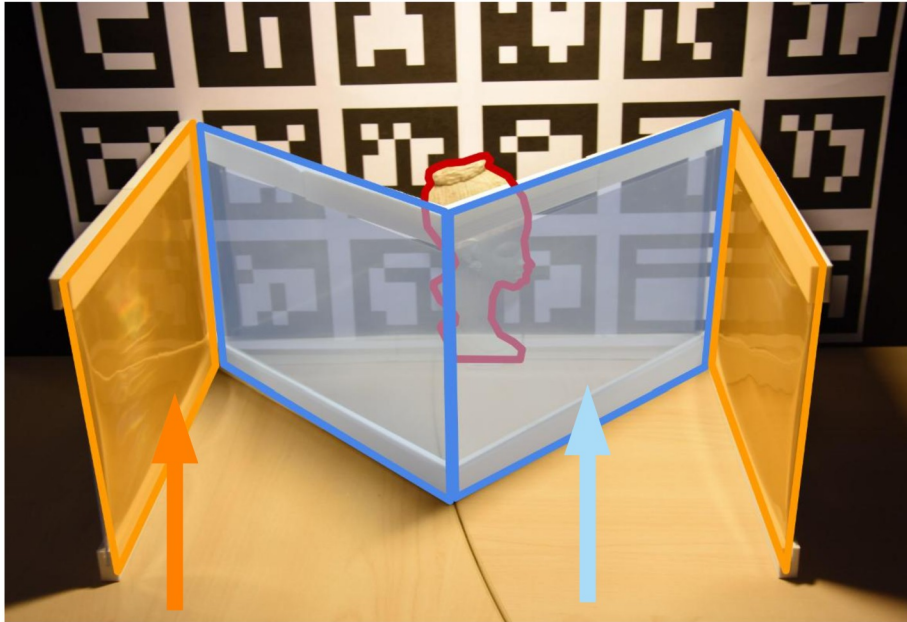


**Mercati di Traiano
Museo dei Fori Imperiali**



ACM JOCCH 2014

EgoSAR : Spatial Augmented Reality for Multiple Users



Retroreflection

Beam splitter

Personalized & view-
dependant augmentation

IEEE ISMAR 2016



4

Archiving



archéovision



Archeo**transfert**



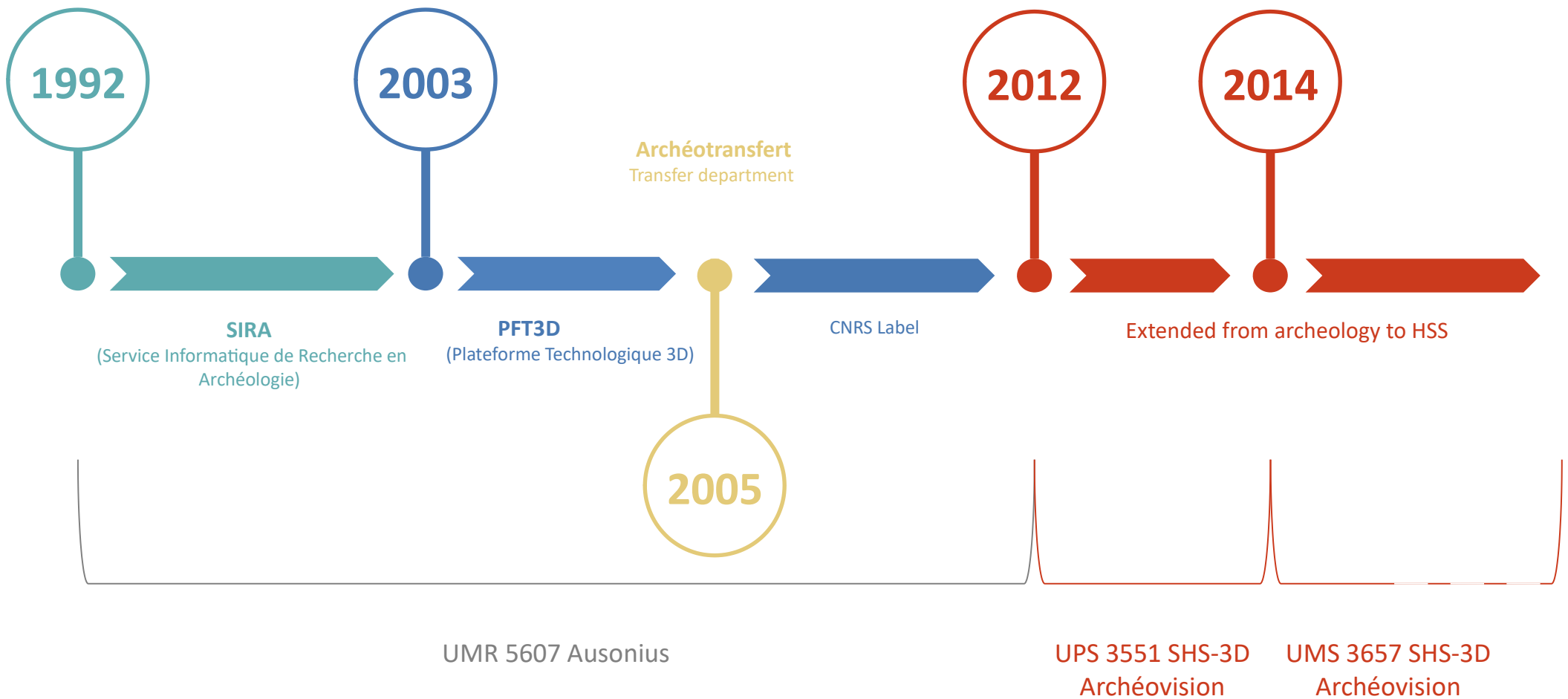
UMS SHS-3D 3657

Cellule de transfert d'Archéovision



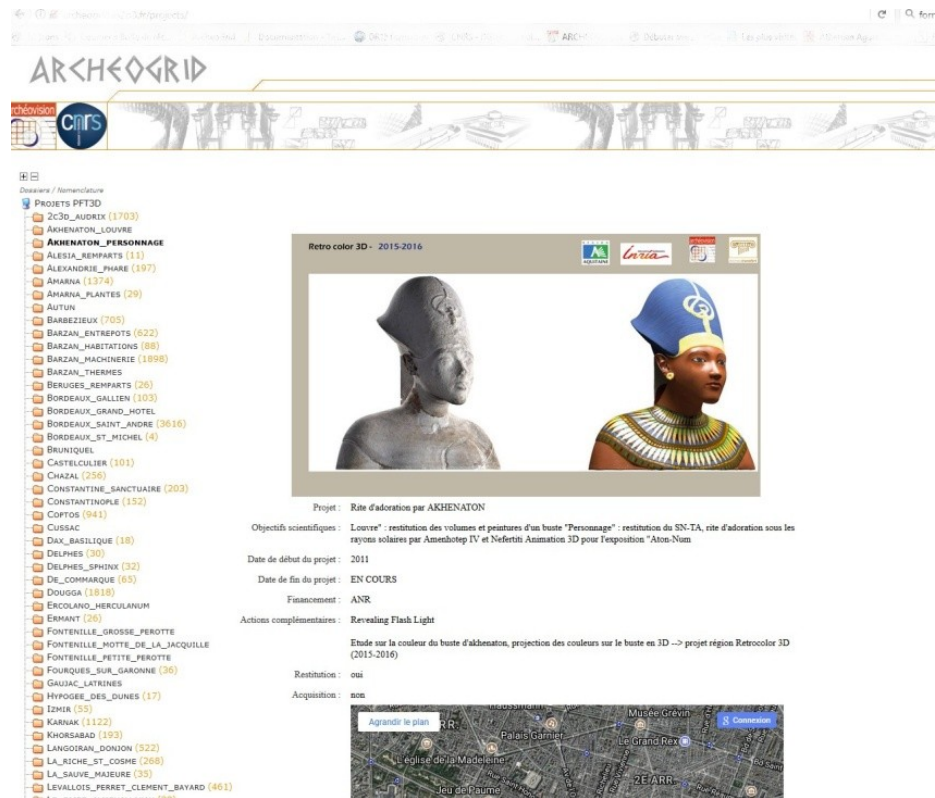
université
de **BORDEAUX**

25 years of experience



Archeogrid : more than 15 years of data organization

- Organize data from the team
- Data management
- Metadata enrichment
- Collaborative work with partners



The screenshot shows the Archeogrid website interface. At the top, the logo 'ARCHEOGRID' is displayed alongside the CNRS logo. Below the header is a navigation menu and a list of projects. The 'AKHENATON_PERSONNAGE' project is highlighted, showing a 3D model of a bust. To the right of the project list, there is a detailed view of the 'Rite d'adoration par AKHENATON' project, including a 3D model of a bust and a 3D model of a woman in an Egyptian headdress. The project details include the following information:

Projet : Rite d'adoration par AKHENATON

Objectifs scientifiques : Louvre : restitution des volumes et peintures d'un buste "Personnage" : restitution du SN-TA, site d'adoration sous les rayons solaires par Amenhotep IV et Nefertiti Animation 3D pour l'exposition "Aton-Num"

Date de début du projet : 2011

Date de fin du projet : EN COURS

Financement : ANR

Actions complémentaires : Revealing Flash Light

Etude sur le couleur du buste d'akhenaton, projection des couleurs sur le buste en 3D -> projet région Retrocolor 3D (2015-2016)

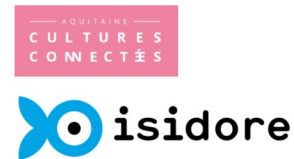
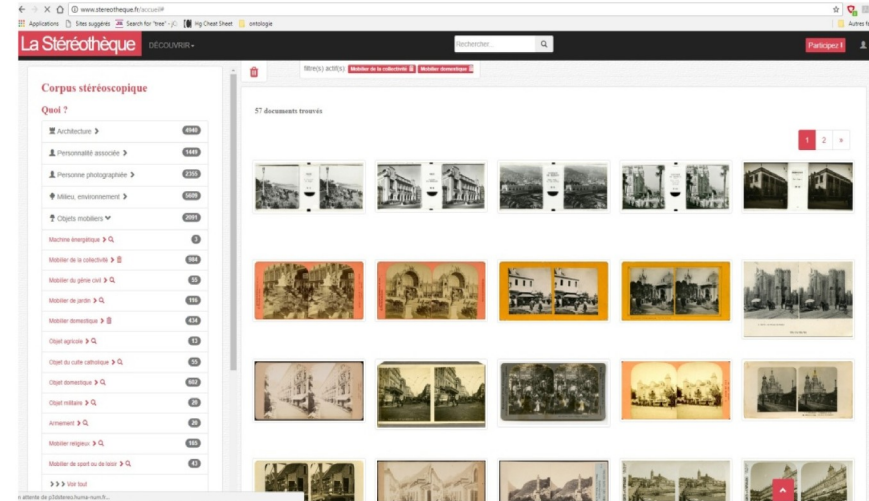
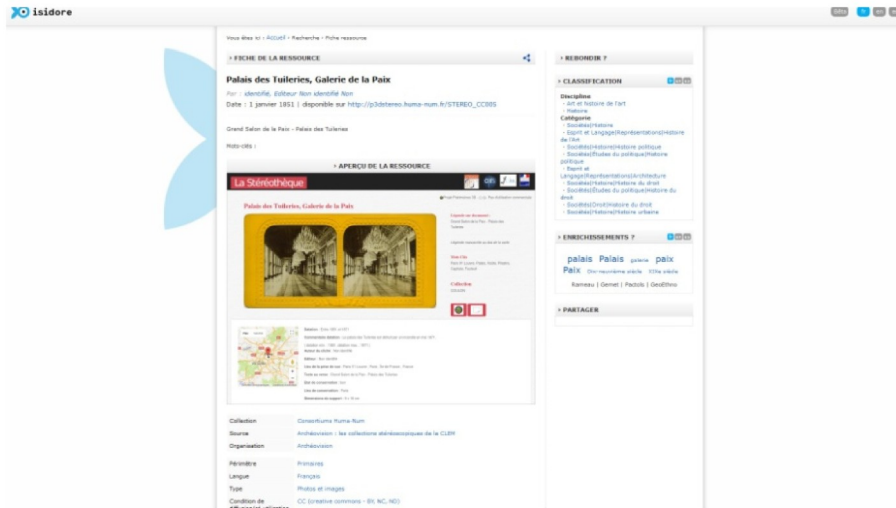
Restitution : oui

Acquisition : non

At the bottom of the screenshot, there is a map showing the location of the project in Paris, France, with markers for 'Agrandir le plan', 'Palais Garnier', 'Musée Grévin', 'Le Grand Rex', 'L'église de la Madeleine', 'Jeu de Quai', and 'ZE ARR'. A 'Connexion' button is also visible.

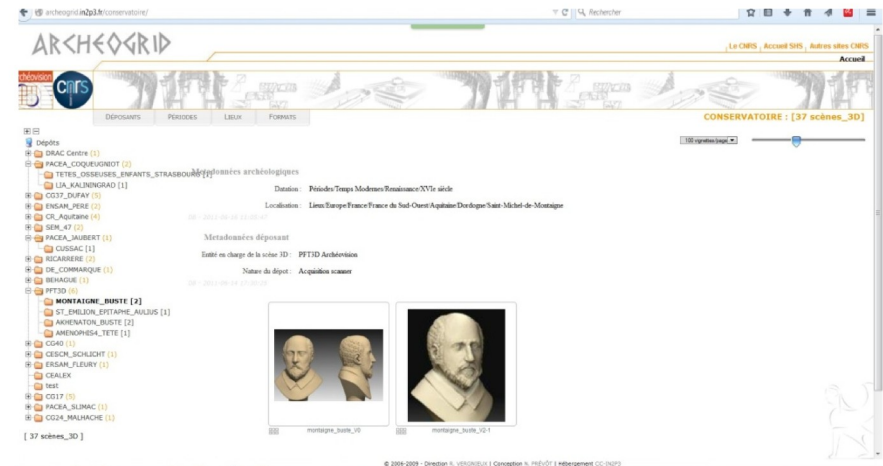
Archeogrid: 3D data diffusion

- Publication of Corpus for research and other public with the Stereotheque
- Gathering and managing metadata



Archeogrid: Data archiving

- Saving into Conservatory of 3D data for HSS, preparation to final archiving to CINES
- Servers from TGIR Huma-Num
 - National Digital Infrastructure for HSS



3D Consortium for Human & Social Sciences

3D for all HSS



Equipes membres du consortium 3D



<https://shs3d.hypotheses.org/>

Goals

Development & good use of 3D tools for HSS

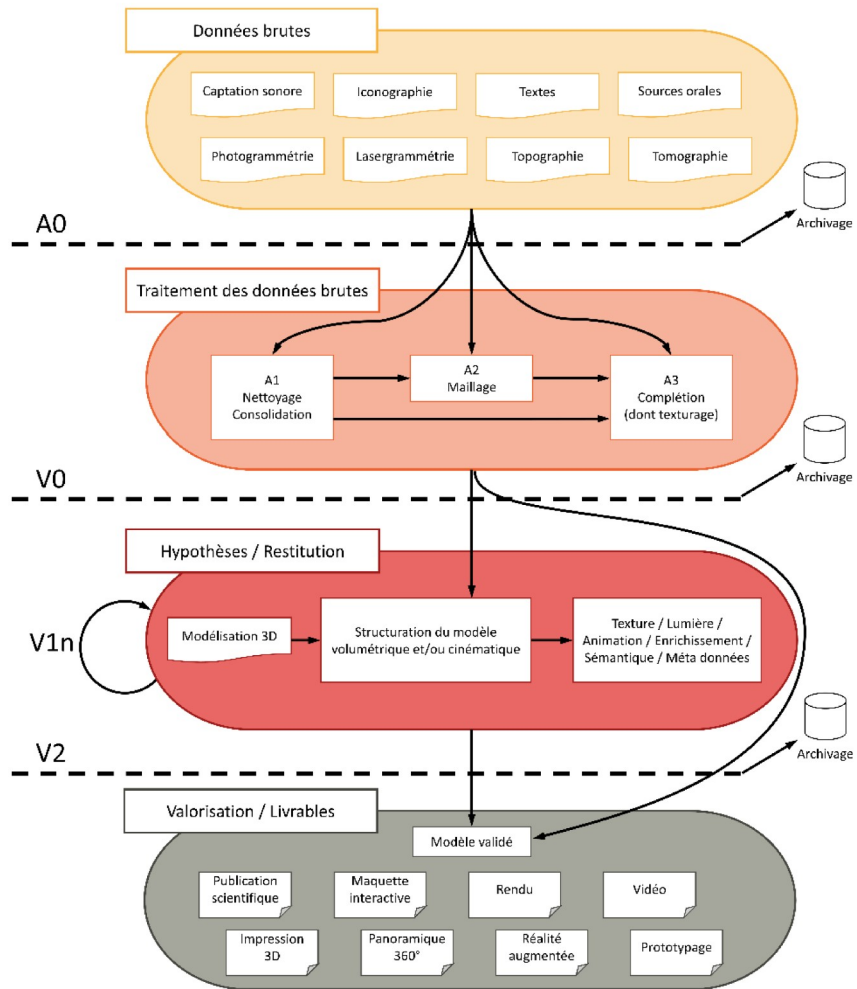
- 4 axes
 1. Technological review
 2. Elaboration and Transmission of Knowledge
 3. Life cycle, interoperability & archiving
 4. HSS meetings: exchanges of uses, communication & formation

consortium3d-coordination@services.cnrs.fr

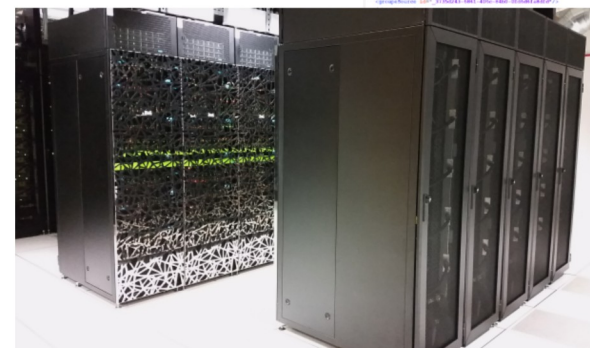
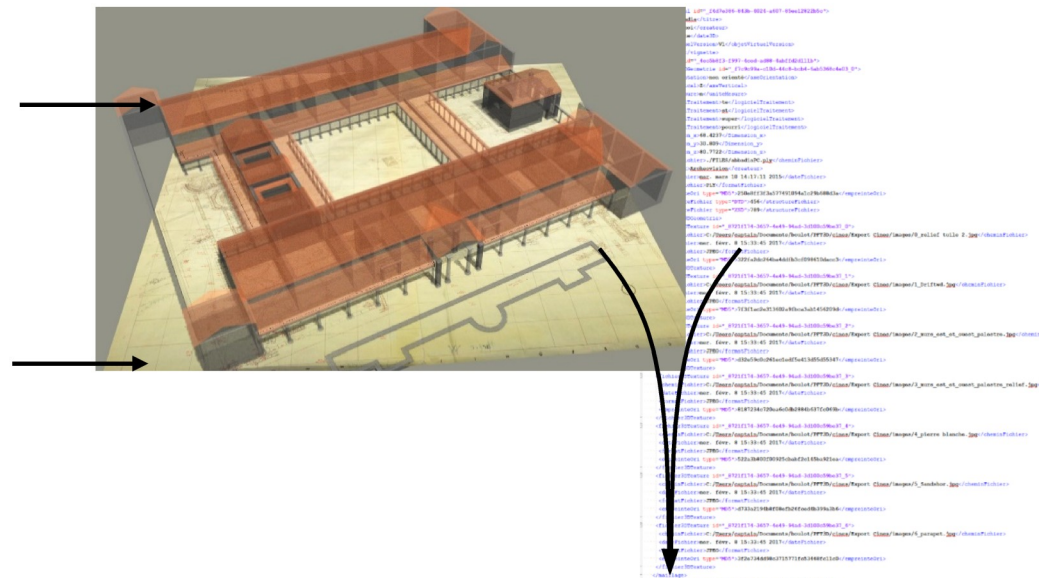




Graphe séquentiel de la production de données 3D



Archiving 3D data



3D Repository for HSS

- aLTAG 3D
 - Archiving software
 - Easy to create metadata
 - Packet creation
- Archiving @ CINES
 - Format ply / dae (COLLADA)
 - Currently in the process of finalisation

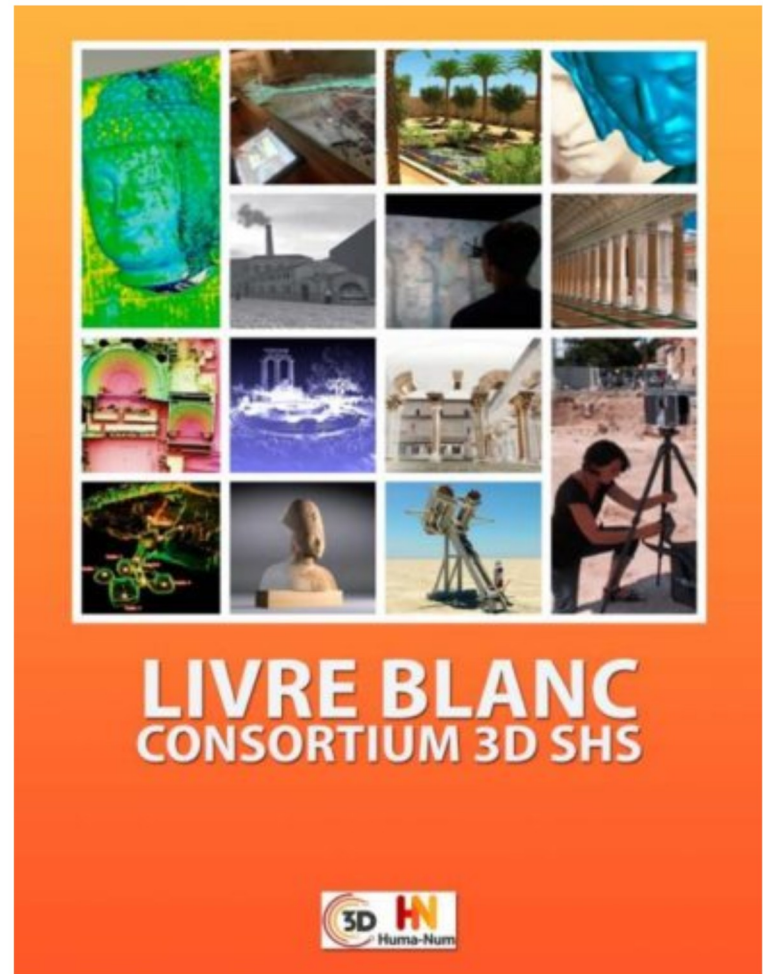


consortium3d-coordination@services.cnrs.fr

White Paper

- Tools &
- Good Practices

<https://hal.archives-ouvertes.fr/hal-01683842/>



5

Open to Collaborate

We are open to collaborate

- Spreading the use of 3D for HSS
 - More international
 - What about a Chinese white paper ?
- Appearance Acquisition
 - New challenges
 - Development of tools for on-site acquisitions
- Visualization
 - New display systems
 - New HCI
- Archiving
 - Challenge: development of tools to explore the archived data
 - Semi-Automatic classification
 - Matching
 -

谢谢

<http://xgranier.free.fr>

