



STSM abstract

Title: Management of data recorded during the COSCH GERMOLLES case study: operating chain, processing and dissemination

Reference: Short Term Scientific Mission, COST TD1201

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Period: from 29.06.2015 to 03.07.2015

Reference code: COST-STSM-TD1201-25222

The COSCH GERMOLLES case study aims at investigating Germolles wall paintings dating from the end of the 14th century using non-invasive spatial and spectral imaging techniques in combination to more traditional analytical techniques. Some important data have already been collected since 2013 using VIS, UV and IR photography (STSM1 by F. Piqué, 2013), spectroradiometry as well as X-ray Fluorescence (STSM2 by F. Piqué, 2014) to:

- Distinguish original material from restoration work,
- Rediscover the original materials and their complex organization,
- Analyse these original materials,
- Approach the painting technique used within Jean de Beaumetz' workshop, one of the French Primitives.

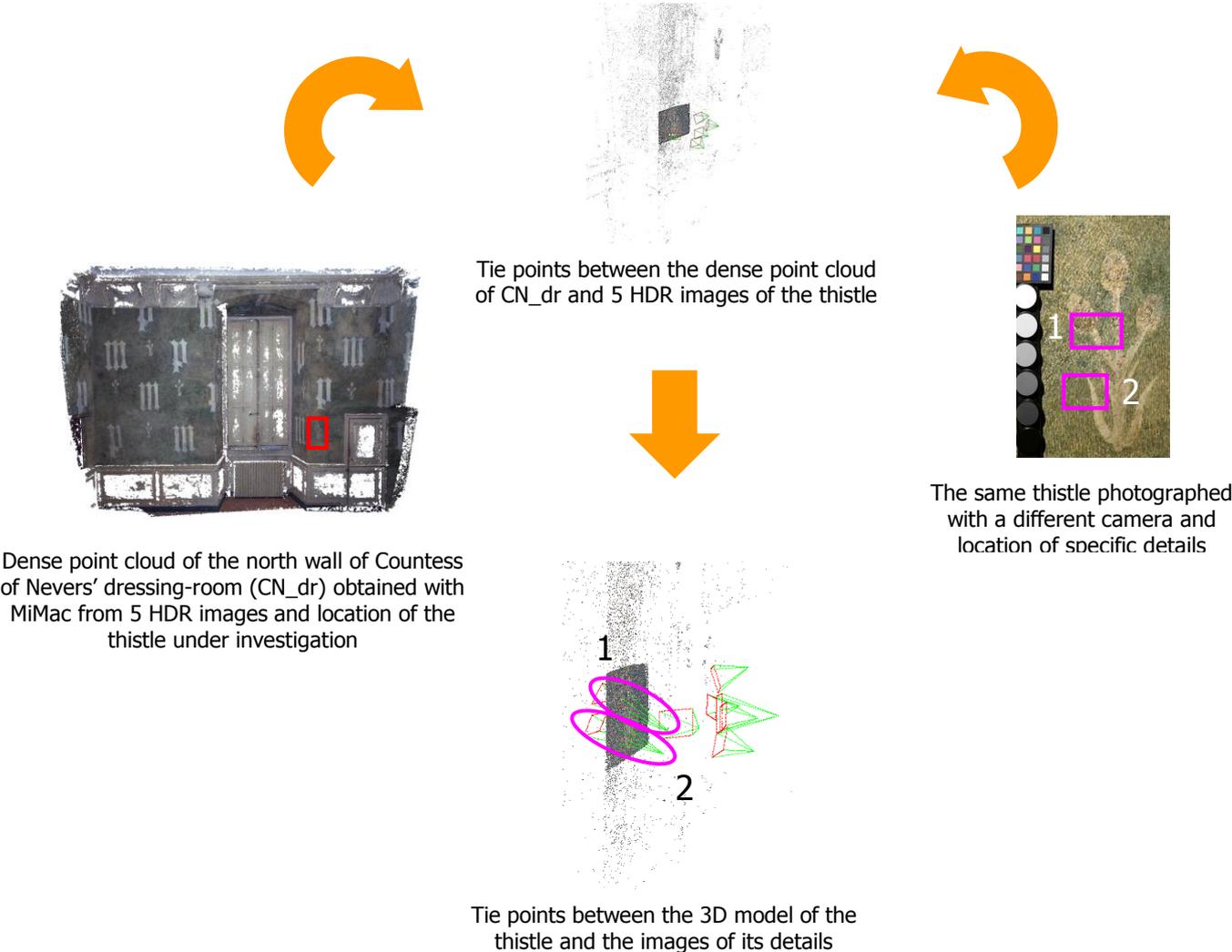
Additional data such as orthophotographic views of some walls as well as preliminary results using Structured Light Imaging (SLI), Highlight - Reflectance Transformation Imaging (H-RTI), IR thermography and Laser Induced Breakdown spectroscopy have been collected.

At the start of the GERMOLLES case study we have already a huge amount of data, heavy files to manage with several softwares that we have to be trained on. More data will be collected in the next two years using preferably non-invasive imaging techniques such as multi-spectral imaging. These preliminary investigations will be used to select representative areas of the wall paintings where invasive sampling will be carried out to further examine the stratigraphy of paint layers.

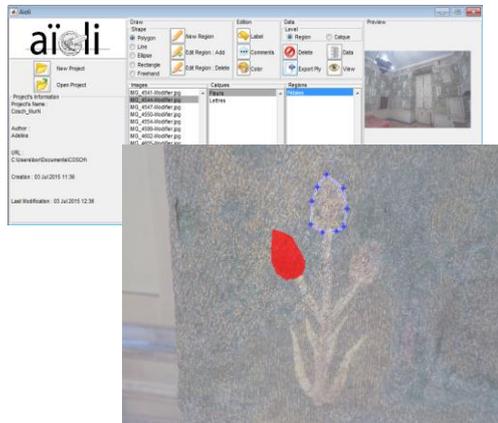
Eventually all the data collected during the imaging and analytical campaigns will serve the 3D virtual representation of the original decoration. Furthermore these data will be used as reference materials for the long-term preservation of the original materials. Indeed regular imaging campaigns should be performed in the future to detect any change in the data collected.

The aim of this STSM was to be introduced to the proper management of the data collected until now by the different experts involved in GERMOLLES case study and to start interconnecting them. Two institutes, both located in Marseille (FR), were visited: the Interdisciplinary centre for heritage conservation and restoration – CICRP and the Research Unit on Modelling and Simulation for Architecture and Heritage - MAP (UMR3495 CNRS/MCC). At MAP the applicant was introduced to MicMac, a tool chain that enables from images to detect tie points, determine their orientations and generate dense point clouds. MAP staff demonstrated as well the possibilities of web-viewer aioli (Architectural Image-Oriented expLoratIon) for image-based 3D navigation and point clouds visualization that allows to jump between the different image points of views, back-projecting the point clouds onto the images. Furthermore ontologies were tested to analyse the methodology used to document Germolles wall paintings supported by annotated virtual representations.

The following figure illustrates the merging of information from different images of Germolles case study using MiMac tool.



This second example shows how aioli web-viewer and MicMac can be used to visualize an area selected on one HDR image on other pictures oriented differently.



Highlighting manually two areas on one of the HDR images of the thistle by drawing their profile and colouring their internal surface



Visualisation of the zones highlighted on another HDR image of the same thistle using the dense point cloud generated with MicMac



Identification of the same zones on two HDR images of the whole north wall