



STSM Report

Photogrammetry applied to problematic artefacts

REFERENCE: Short Term Scientific Mission, COST TD 1201

Beneficiary: Dr. Corina Nicolae, Romanian National History Museum, Bucharest, Romania

Host: Dr. Fabio Remondino, head of 3DOM research unit, Fondazione Bruno Kessler (FBK), Trento, Italy

Period: from 03/11/2013 to 13/12/2013

Reference code: COST-STSM-TD1201-15464

Place: 3DOM research unit, Fondazione Bruno Kessler (FBK), Trento, Italy

The overall aim of this STSM was to use close-range photogrammetry in order to create 3D models of three types of artefacts which present several problems due their material, size, color and shape, and to present different sets of results obtained using different parameters for data processing, which could answer different purposes (research, documentation, visualization) for cultural heritage experts.

Close-range photogrammetry was used since it is an effective technique and to improve digital methods, it became a more economic method. In contrast to other more complex and expensive solutions, close range photogrammetry is relatively accessible to professionals from the non-technical fields of expertise, such as curators or archaeologists, due to improvements of the digital cameras and their relative low costs of acquisitions, and also ease of image capturing and use of dedicated software for camera calibration and measurement.

The report includes the following pipeline for each of the considered artefacts:

- image data acquisition with a SLR digital camera
- camera calibration and image orientation, using automated procedures able to extract homologues points between the images and the unknown camera parameters;
- dense matching and 3D reconstruction for the generation of dense point clouds;
- polygonal model generation and texture mapping for analyses and visualization.

For all three artefacts, several data processing methods have been tested in order to better understand how the outcome of the 3D survey by means of close range digital photogrammetry would best answer the need of cultural heritage experts for scientific documentation, conservation, restoration and dissemination of CH objects. All of the three study-cases represent, at smaller scale, some of the problems encountered when using digital photogrammetric approach and, using the results obtained, guidelines and best practices based on real study-cases might be developed, which is in full concordance with the general objective of the COST Action TD 1201 and with the aims of WG 5 - Visualisation of CH objects and its dissemination.

