The use of 3D imaging techniques to digitize and visualize Technical Cultural Heritage artefacts

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Short description

The 3D visualization of scientific and technical Cultural Heritage (ST CH) artefacts is often difficult due to their complicated shape, reflective metal surfaces and numerous mechanisms that move in different spaces. New technologies are constantly developed to make 3D representations easier to obtain. The objective of this STSM was to get an overview of the different 3D imaging techniques that can be used on ST CH objects and to see which technique fits the best to the artefact considered within this STSM as regards the shape and the surface rendering. The techniques that are the most accessible to end-users (conservation professionals) were further investigated to precise the conditions of a complete survey of an artefact representative of those usually found in our domain of expertise. The reference object chosen (ring enlarger) regroups specificities of ST CH objects.

Considering the short duration of the STSM a selection of two optical techniques was made by the host: photogrammetry (passive system) and handheld self-positioning 3D laser scanner (active system). We also decided to add the preliminary results acquired by the beneficiary during the COSCH Training School held in Warsaw on robotized structured light system (active system) in November 2013.

With such a complicated object we are interested in seeing how much relevant information the 3D model can carry. Can a 3D model be used as an information source like the real object? Should the 3D model be a perfect copy of the reality containing tremendous amount of information? We can decide to have a look-like model who store relevant information on the real surface and/or we can put our effort to build a work-like model using reverse engineering (RE). All depends on the final use of the 3D model. A list of potential purposes of digitization of ST CH objects is presented in the full report.

3D Digitalization of Technical Cultural Heritage

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Digitalization

Reverse engineering

Reflective surface

Historical evidence

Aged surfaces

Independant and Moving parts

Data Processing

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