Leafing through the painting “Ecce Homo” by Antonello da Messina: multimodal imaging techniques and data-fusion

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European Research Infrastructures for Heritage Science enable access to cutting-edge technologies and top-level expertise to solve specific queries on high value artworks and heritage assets. A successful example of this approach was the ECCEHOMO Project, carried out within E-RIHS program [1-3] and dedicated to non-invasive multimodal analysis of the painting “Ecce Homo” by Antonello da Messina (ca. 1430–1479). This masterpiece of the Early Italian Renaissance is carefully preserved at the Collegio Alberoni in Piacenza (Italy). Being extremely fragile, this painting needs continuous monitoring and the implementation of careful preventive conservation strategy, which should be based on sound knowledge of materials and conservation status of the painting. The interdisciplinary research undertaken in the project combined cutting-edge 3D and 2D techniques to perform a systematic, rigorously non-invasive, analysis of the artwork. By exploiting the complementarity of imaging spectroscopic techniques operating in different regions of the electromagnetic spectrum (from X-rays to the Ultraviolet, Visible and Infrared ranges) the painting was fully investigated, virtually ‘leafing through' its levels and structures the from the surface to the wooden support. Structured-light 3D metrological survey was used to digitize the external surface of the artwork. The surface irregularities and the support were analyzed with a structured-light 3D scanner and X-ray tomography. UV fluorescence was used to visualize the aged layers of varnishes. X-ray fluorescence scanning (MA-XRF) and reflectance hyperspectral imaging (HSI) were combined to study pictorial materials and their distributions, and the artist technique. Hidden details were brought to the light, like a fingerprints traces. Data-fusion from the 2D and 3D techniques provided new insights on the artwork and updated documentation of the conservation status. The obtained digital documentation was exploited to compile web-based interactive platforms targeted at the visualization and dissemination of the results, for both professional users and large public.

[1] http://vcg.isti.cnr.it/activities/eccehomo/

[2] Albertin, F., Ruberto, C., Cucci, C. et al. “Ecce Homo” by Antonello da Messina, from non-invasive investigations to data fusion and dissemination. Sci Rep 11, 15868 (2021)

[3] Cassar J. and Strlič M. 2021. *Transcending Boundaries: Integrated Approaches to Conservation. ICOM-CC 19th Triennial Conference Preprints, Beijing, 17–21 May 2021*, ed. J. Bridgland. Paris:, ICOM-CC

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