

DIGITAL ANASTYLOSIS OF FRESCOES CHALLENGE (DAFNE)

VIRGINIO CANTONI, LUCA LOMBARDI, GIOVANNA MASTROTISI*, ALESSANDRO SEGIMIRO**, ALESSANDRA SETTI

Dept. of Electrical, Computer and Biomedical Engineering, University of Pavia, Italy –

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virginio.cantoni@unipv.it, luca.lombardi@unipv.it,

giovanna.mastrotisi@rotarycultura.it, alessandra.setti@unipv.it

Abstract.

To highlight the importance of cultural heritage assets conservation, and promoting restoration and re-use of buildings that would otherwise be lost forever, we propose an international challenge to look for solutions that support reconstruction after destructive phenomena, such as earthquakes or wars. In particular, we focus on reconstruction of frescoes. The task is to re-assemble a usually large set of fragments, collected and cataloged after the destructive event. The fragments, photographed with the same distance and lighting conditions, and uniquely identified, will be first digitally re-assembled and then re-composed by restorers. The current state-of-the-art research in virtual anastylosis presents several trials and case studies in this context, based on a combination of different digital measurements and modelling techniques, accompanied by the interpretation of data coming from documentary sources. The challenge initially originated with the aim of involving autistic subjects in the post-seismic re-composition of destroyed frescoes, engaging them in a ‘puzzle’ solving, trying to increase their social involvement while favoring their inclusion in productive activities, enhancing their peculiarities and abilities, and promoting and appreciating their potential. Our goal has been extended to get to a software tool that applies the most advanced techniques, such as Machine Learning and Deep Learning. Furthermore, as different tracks are proposed, this initiative can bring to different applications. It widened then in a research of up-to-date artificial intelligence solutions suitable to the restoration of collapsed buildings, so promoting their re-use, enhancing cultural heritage conservation.

Keywords: *digital anastylosis, frescoes restoration, artificial intelligence, cultural heritage, autistic subjects engagement*