

THREE-DIMENSIONAL MODEL AND DIGITAL RESTORATION OF A MEDIEVAL GRAVESTONE

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The digital or virtual restoration does not act on the art work, but simulates a visual and aesthetic improvement of this one, so enhancing it. It also gives the possibility to choose a series of solutions, before technical operations. Virtual restoration can be therefore defined as the set of digital processing of two or three dimensional computer graphics, allowing for visual and aesthetic improvements of the work or a hypothetical reconstruction which is not real, but virtual precisely. Moreover, it is useful to better understand a work of art (both mobile and immobile) or document archives, that for serious reasons of physical degradation cannot be easily restored in the traditional way. In this work we present results of virtual restoration in 2 and 3 dimensions using common open source software, namely GIMP package, thus proving the efficiency of free codes with respect to more known and generally adopted commercial products.

On the other side, automatic 3D reconstruction technologies have evolved significantly in the last decade. Among various 3D scanning systems, the more frequently used in digitizations are the so-called active optical devices that reconstruct geometry of a artwork by checking how the light is reflected by the surface. Very promising, but still not very common, are the passive optical devices, where usually a large number of images of the artifact are taken and a complete model is reconstructed from these images. These approaches have been both applied to the relief and investigation of a Medieval gravestone conserved in Civico Museo Medievale of Bologna, Italy, representing a noble warrior in his habits. It is worth mentioning the use made of GIMP in the analysis and processing of the data.

Finally, as for the adopted methodology, the present virtual restoration is accompanied by archival and historical studies and diagnostic investigations by means of SEM, microanalysis and thermography, that contribute to a better understanding of the conservation status of the studied artifact as they are very often neglected in many applications of image processing of artistic works. Moreover, our work is clearly illustrated in each phase of the digital treatment, thus allowing for critical debates and different interpretations by other scholars that are provided of the complete documentation, as required by a really scientific approach.

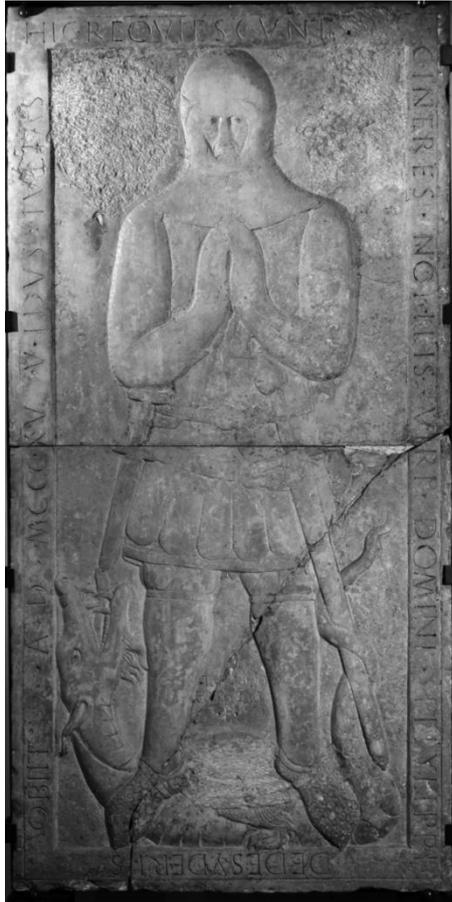


Fig. 1 *Lastra Desideri*, photograph



Fig. 2 *Lastra Desideri*, preliminary steps of virtual restoration



Fig.3 Final result of the virtual restoration of the Filippo Desideri gravestone

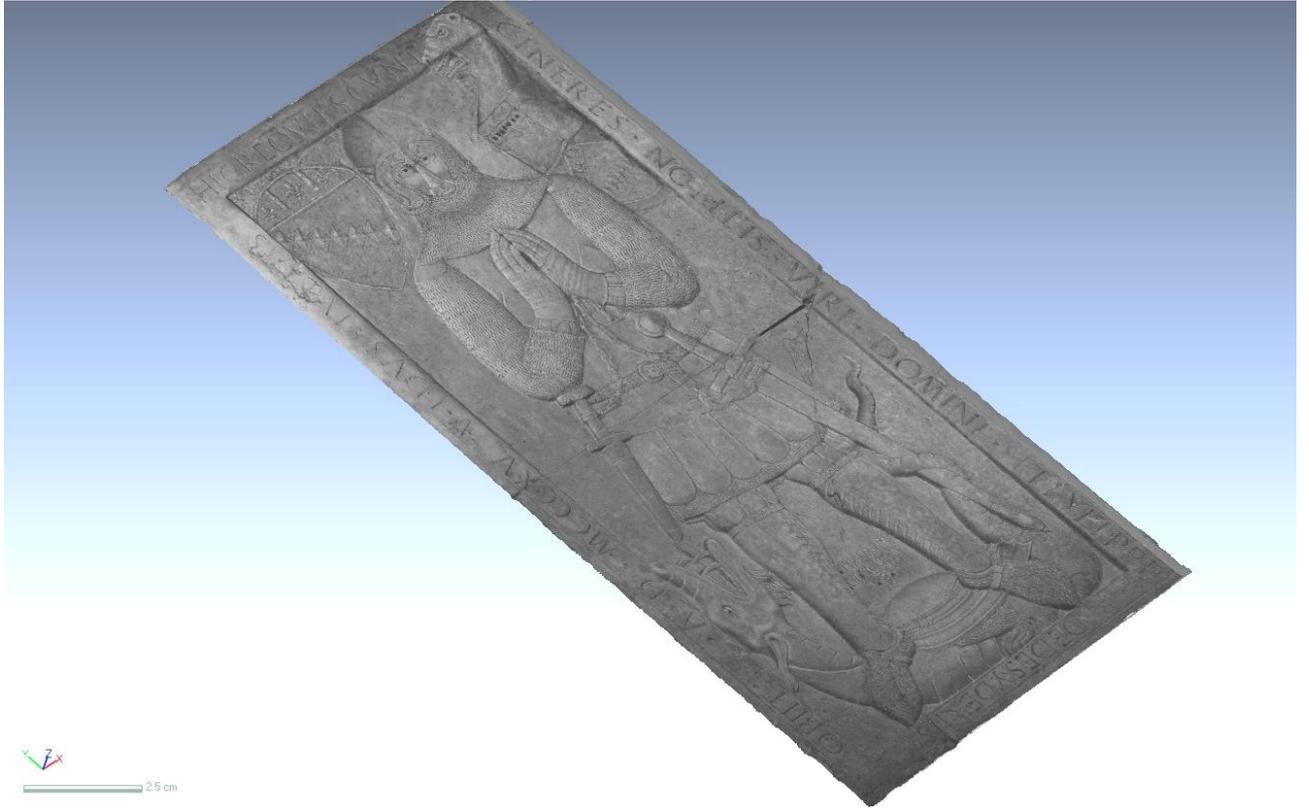


Fig. 4 Three-dimensional restoration of the gravestone; partial results