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RANGE AND IMAGE BASED MODELLING: A WAY FOR FRESCOED VAULT TEXTURING OPTIMIZATION

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Abstract. In the restoration of the frescoed vaults it is not only important to know the geometric shape of the painted surface, but it is essential to document its chromatic characterization and conservation status. The new techniques of range-based and image-based modelling, each with its limitations and advantages, offer a wide range of methods to obtain the geometric shape. In fact, several studies widely document that laser scanning enable obtaining three-dimensional models with high morphological precision. However, the quality level of the colour obtained with built-in laser scanner cameras is not comparable to that obtained for the shape. It is possible to improve the texture quality by means of a dedicated photographic campaign. This procedure, however, requires to calculate the external orientation of each image identifying the control points on it and on the model through a costly step of post processing. With image-based modelling techniques it is possible to obtain models that maintain the colour quality of the original images, but with variable geometric precision, locally lower than the laser scanning model. This paper presents a methodology that uses the camera external orientation parameters calculated by image based modelling techniques to project the same image on the model obtained from the laser scan. This methodology is tested on an Italian mirror (*a schifo*) frescoed vault. In the paper the different models, the analysis of precision and the efficiency evaluation of proposed methodology are presented.

[Conference Paper](#) (PDF, 780 KB)

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