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Systems based on photogrammetry to evaluation of built heritage: tentative guidelines and control parameters

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Abstract. Technological innovations based on close-range imaging have arisen. The developments are related with both the advances in mathematical algorithms and acquisition equipment. This evolution allows to acquire data with large and powerful sensors and the fast and efficient processing of data. In general, the preservation of built heritage have applied these technological innovations very successfully in their different areas of intervention, namely, photogrammetry, digital image processing and multispectral image analysis. Furthermore, commercial packages of software and hardware have emerged. Thus, guidelines to best-practice procedures and to validate the results usually obtained should be established. Therefore, simple and easy to understand concepts, even for nonexperts in the field, should relate the characteristics of: (i) objects under study; (ii) acquisition conditions; (iii) methods applied; and (iv) equipment applied. In this scope, the limits of validity of the methods and a comprehensive protocol to achieve the required precision and accuracy for structural analysis is a mandatory task. Application of close-range photogrammetry to build 3D geometric models and for evaluation of displacements are herein presented. Parameters such as distance-to-object, sensor size and focal length, are correlated to the precision and accuracy achieved for displacement in both experimental and on site environment. This paper shows an early stage study. The aim consist in defining simple expressions to estimate the characteristics of the equipment and/or the conditions for image acquisition, depending on the required precision and accuracy. The results will be used to define tentative guidelines considered the all procedure, from image acquisition to final results of coordinates and displacements.

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