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## **METRIC AND NON-METRIC CAMERAS CALIBRATION FOR THE IMPROVEMENT OF REAL-TIME MONITORING PROCESS RESULTS**

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### **Abstract**

In recent years non-metric digital cameras have known a great development, being used in wide applications, such as: real time monitoring and preservation of cultural heritage, the shoreline dynamics study, the wave movement for costal protection, soil erosion, etc. Classic photogrammetry with the use of metric cameras are still of great use in areas such as architecture and environmental imaging. An old problem occurs when we want to extract metric information from our environment using close-range photogrammetry, with metric or non-metric calibrated cameras. There are many methods for this process that have been developed in some studies, by several authors. In this paper we present the Heikkilä and Silven method to determine the parameters of the UMK 10/1318 terrestrial photogrammetric camera and the parameters of a Canon EOS Rebel XSi/450D digital camera. To achieve the proposed goal, a 3D calibration object was made on which, 42 points with known 3D coordinates were marked. The 3D coordinates were measured with the help of a Coordinate Measuring Machine (CMM) produced by Aberlink, with a 2 $\mu$ m precision. Through this calibration process the standard projective parameters of effective focal length and principal point along with radial and tangential distortion coefficients were determined. The purpose of this work is to make a first step in the analysis of the degree of confidence when using a non-metric camera to reconstruct an object in 3D.

*Key words:* calibration, close-range photogrammetry, CMM, digital camera, UMK

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