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PERFORMANCE EVALUATION OF THERMOGRAPHIC CAMERAS FOR PHOTOGRAMMETRIC MEASUREMENTS

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Abstract. The aim of this research is the performance evaluation of the termographic cameras for possible use fo photogrammetric documentation and deformation analyses caused by moisture and isolation problem of the histori and cultural heritage. To perform geometric calibration of the termographic camera, the 3D test object was design with 77 control points which were distributed in different depths. For performance evaluation, Flir A320 termograph camera with 320 × 240 pixels and lens with 18 mm focal length was used. The Nikon D3X SLR digital camera with 6 × 4032 pixels and lens with 20 mm focal length was used as reference for comparison. The size of pixel was 25 µm the Flir A320 termographic camera and 6 µm for the Nikon D3X SLR digital camera. The digital images of the 3D tes object were recorded with the Flir A320 termographic camera and Nikon D3X SLR digital camera and the image coordinate of the control points in the images were measured. The geometric calibration parameters, including the f length, position of principal points, radial and tangential distortions were determined with introduced additional parameters in bundle block adjustments. The measurement of image coordinates and bundle block adjustments wi additional parameters were performed using the PHIDIAS digital photogrammetric system. The bundle block adjustm was repeated with determined calibration parameter for both Flir A320 termographic camera and Nikon D3X SLR dig camera. The obtained standard deviation of measured image coordinates was 9.6 µm and 10.5 µm for Flir A320 termographic camera and 8.3 µm and 7.7 µm for Nikon D3X SLR digital camera. The obtained standard deviation o measured image points in Flir A320 termographic camera images almost same accuracy level with digital camera i comparison with 4 times bigger pixel size. The obtained results from this research, the interior geometry of the termographic cameras and lens distortion was modelled efficiently with proposed approach for geometric calibratio

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