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ANALOGOUS VS. DIGITAL CAMERAS
FOR BUILDINGS 3D MODELS CREATION

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Abstract

In this paper, the steps used in the process of building 3D model creation, using images acquired with the UMK 10/1318 metric terrestrial photogrammetric camera and digital images acquired with the Canon EOS Rebel XSi/450D digital non-metric camera, are presented in detail. For the calibration process of both cameras, the Heikkila and Silven algorithm and a 3D calibration object were used. In order to save time, both on the field and back to the office, instead of taking and processing UMK images by the classic method of stereophotogrammetry, a new methodology was suggested. So, the UMK 10/1318 photogrammetric camera is used in a modern process of acquisition and processing of terrestrial images through the multi-image photogrammetric process. The buildings 3D models accuracy was evaluated based on the coordinates of the characteristic points and by a proposed method which implies the transformation of the 3D model into a 3D mesh surface. While applying this method, the 3D model is compared with a reference model created based on TLS (Terrestrial Laser Scanner) data, using as comparison metric the Hausdorff distance. The purpose of this work is to analyse the degree of confidence when using a non-metric digital camera to create a building 3D model and to determine the differences between two 3D models, especially CAD models, with high precision, in a completely automated way.

Key words: 3D model, analogous cameras, calibration, digital cameras, Hausdorff distance

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