

** The author(s) of each abstract is/are solely responsible for the content.*

ABSTRACTS

Using Photogrammetric Methods for 3D Modelling of Constructions

Elemer-Emanuel Suba, Tudor Salagean, Ioana Delia Pop, Florica Matei, Jutka Deak(Romania)

Keywords: 3D modelling, Photogrammetry, UAV, Point cloud

Abstract

3D modeling of buildings is a topical activity, especially in the preservation of various buildings requiring conservation works, or within the monuments. In case of photogrammetric works, the premarking of ground control points is one of the most important stages. The present paper aims to review the main steps to be taken in order to obtain a 3d model by photogrammetric methods of a building. It will also address the subject of calculating the cover surface, in order to repaint it, task for which the present work was required. In addition to determining the surface of the roof, the facades orthophotomaps were made, which can later serve to achieve the facade revelation. The UAV photogrammetric method, as well as terrestrial photogrammetry, were used to carry out the imposed tasks. Ground control points were determined by established classical methods. Ground control points have been chosen so as to cover evenly the studied surface. The points on the facades were pre-marked, and the ones on the roof were chosen from the fixed elements. The control points on the roof as well as on the facades were measured using a reflectorless total station. In order to obtain as accurate results as possible, it was chosen to create a traverse using the closed loop method. The compensations for this traverse was carried out by rigorous methods applying least mean square methods. Regarding the results obtained by photogrammetric modeling, this method can not be compared in terms of precision with the determinations made by the terrestrial laser scanning technique, but UAV photogrammetry technology, unlike terrestrial laser scanning, allows the shaping of hard-to-reach areas such as the roof of some buildings. Also, this technique is far less expensive from the point of view of initial investment in specialized equipment. Taking into account the above-mentioned aspects, photogrammetric technology, whether terrestrial, or UAV, or a combination of the two, is a very accessible 3D modeling method.