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ASSESSMENT OF PHOTOGRAMMETRIC MAPPING TO DETERMINE VOLUMETRY OF CONSTRUCTION AND DEMOLITION WASTE

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Abstract

This paper evaluates the products generated by Unmanned Aerial Vehicles used as tools to survey objects on surfaces. A Digital Elevation Model obtained from a photogrammetric process is then compared with another model obtained from a traditional Total Station survey. Different precision metrics are used, both for the Digital Elevation Models generated and for the points collected. The results of both forms of surveying objects on surfaces show that the products obtained with the photogrammetric method deviate importantly from those obtained with the Total Station survey (overestimations in some points of up to 50 cm). However, because it results in significant time savings in data collection, the photogrammetric method is generally more useful. The precision values of the Digital Elevation Model produced by the photogrammetric method give a ground resolution of 4.79 cm/pix, a mean error of ground control points of 1.31 cm and a point density of 436 points/m^2. On the other hand, the comparative precision values between the products of both survey methods are 0.23 m in the Absolute Mean Deviation and 0.58 m in the Root of the Mean Square Deviation. Additionally, more precise metrics were also obtained by analyzing zones with different densities of collected points. It should be noted that the main differences between the products of both survey methods were due to the low density of sampling points within the study area, particularly in the case of Total Station survey.

Keywords: accuracy assessment, construction demolition waste, photogrammetry, UAV

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