

CLOSE-RANGE PHOTOGRAMMETRY: 3D DATA COLLECTION IN YOUR CONTROL

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ABSTRACT:

Photogrammetry has many advantages to offer as a method for capturing three-dimensional digital data. These advantages can be grouped into categories related to equipment used, type of subject, type of output, etc. However, possibly the most decisive factor in favour of terrestrial or close-range photogrammetric (CRP) is that the quality of the process (from image capture to final product output) is governed by the operator. By evaluating the CRP process we can take steps to identify, minimize and quantify error. The error can be grouped into two categories; direct and indirect. Direct error refers to those parts of the process over which the operator has nearly complete influence, or decision making as to how complete the error may be removed. These include the quality of photos, imaging in stereo an object of known dimension to provide real world units, and the stereoscopic overlap and configuration of the photos taken. Indirect refers to those errors which can only be limited by the operator and not completely removed, such as the lens distortion and alignment of the lens to the sensor during camera construction. The impact of error in the CRP process may be greatly reduced, and accurately quantified when a simple series of guides are followed. By minimizing and quantifying the error in a CRP project the resulting data can be discussed in terms of root mean square error, regardless of the use of externally collected geographic coordinate control. Defining a confidence level allows the data to be utilized in a wide variety of scientific and resource documentation and monitoring applications. Small areas such as a rock art panel or a dinosaur footprint, to ancient puebloan masonry structures, to gravel pit monitoring may be conducted with both ground based or low-level aerial (UAS) platforms..

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