Tishk International University-
Faculty of Engineering

Small object Documentation Using Close Range Photogrammetry

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Project Concept

The concept of this project is To make a 3D model for a small objects using phone camera and photo-Modeler scanner software based on the digital closed range photogrammetry procedure and techniques.

PROJECT ANALYSIS AND DECISION

For analyzing and creating the 3D model of the objects based on the photos and using a specific software (Photo-Modeler) scanner. The calibration performed to find the camera parameters and getting a better result in of the model. The instruments used on this project are a phone camera (iPhone 11 pro max), total station and Photo-Modeler Scanner. A fine 3D model of the small objects were created using a good procedure. The assessment of the created 3D models shown in the below features.

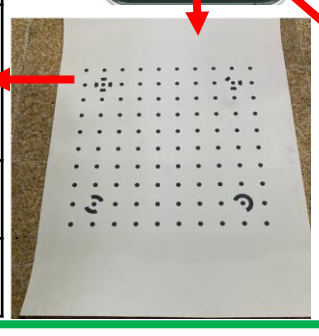
Material and procedure

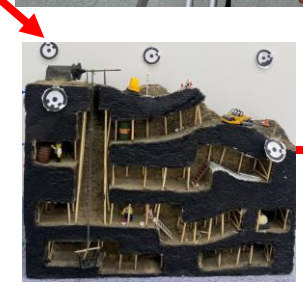
For creating the required 3D model of the small objects. Firstly, selected the objects. Then, select the camera type for taking the photos. At the same time, camera calibration performed for our camera by using calibration sheet in laboratory. After that, for our experimental tests, scaling and georeferencing procedure where placed some target points on the objects. Finally, without removing or changing the location of the targets, the photos of the objects taken by linear method by selected camera phone, and take the coordinate of the targets by total station instrument.

Diagram, chart, Data analysis, Photos

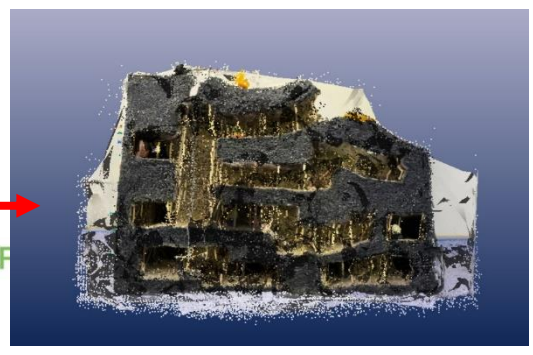
Point	Easting	Northing	Elevation
1	1005.770	995.589	98.403
2	1006.235	995.644	98.525
3	1006.091	996.141	98.381
4	1006.071	995.779	98.383

Parameters	Values
Focal Length	5.963913 mm
Xp principal point x	2.986165 mm
principal point y	3.933086 mm
Omega Phi Kappa	1.985253 deg -28.087615 deg -2.582627 deg





PHOTOMODELER



RESULTS AND CONCLUSION

some small objects are expensive and needs to be document in a digital form. Photogrammetric techniques is one of the common method used to this purpose nowadays. The accuracy of this method depends on some points. The camera property and type is the most important one. Secondly, the texture of the object surface also affects on the quality of creating the digital model forms. Finally, the procedure and software's are another factors needs to be considered based on the type of creating the model. Two different objects used for this purpose. The result of both models are shown below.