ZEB HORIZON UAV Georeferencing

Contents

1. GEOREFERENCING ZEB HORIZON TYPE OF CONTROL POINTS

1.1 UAV FARM TESTING SITE

1.1.1 Checkerboards and spheres

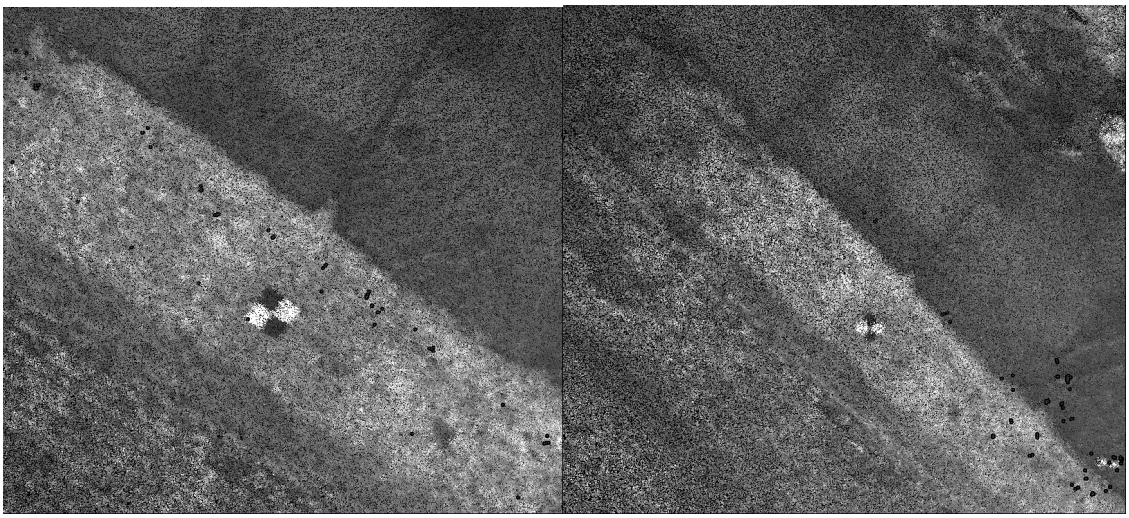


FIGURE 1. CHECKERBOARD TARGETS VISIBLE IN POINT CLOUD DATA

Flight 1 (on the left) , low altitude (15 m) , more density on the control point , Flight 2 (on the right), high altitude (30 m) , lower density but control points are still visible and possible to fit a model of the checkerboard into it.

The same area has been captured with spheres placed as control points. Shape of the spheres is visible quite clearly from the flight of about 15 m height. Example below.

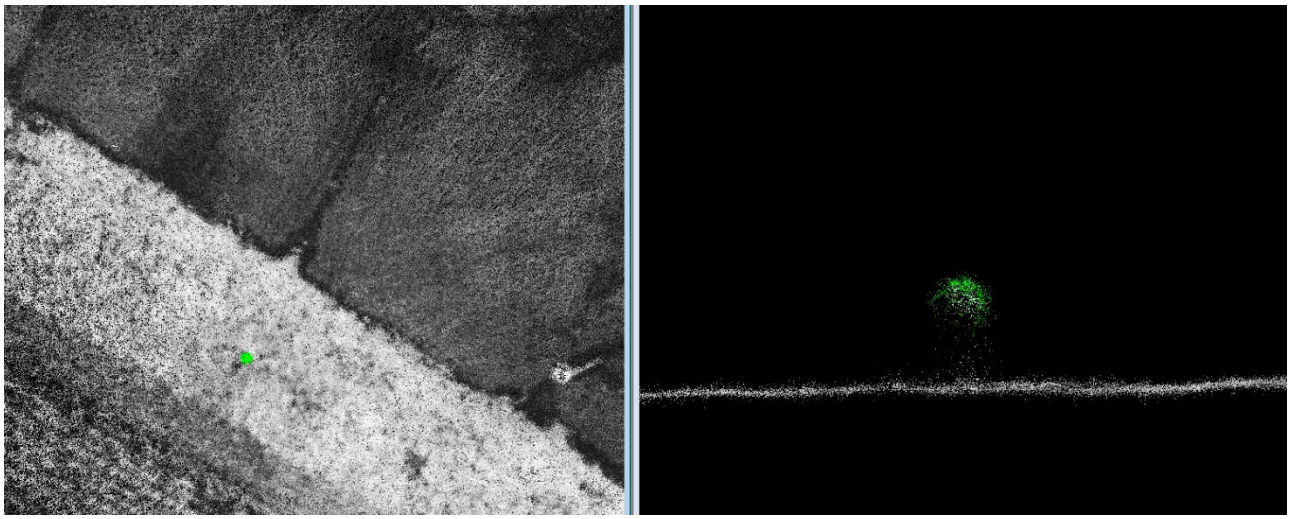


FIGURE 2. SPHERES PLACED AT THE GCP AND DETECTED IN THE POINT CLOUD

Photographs of the control points placed on the permanent markers installed on site.

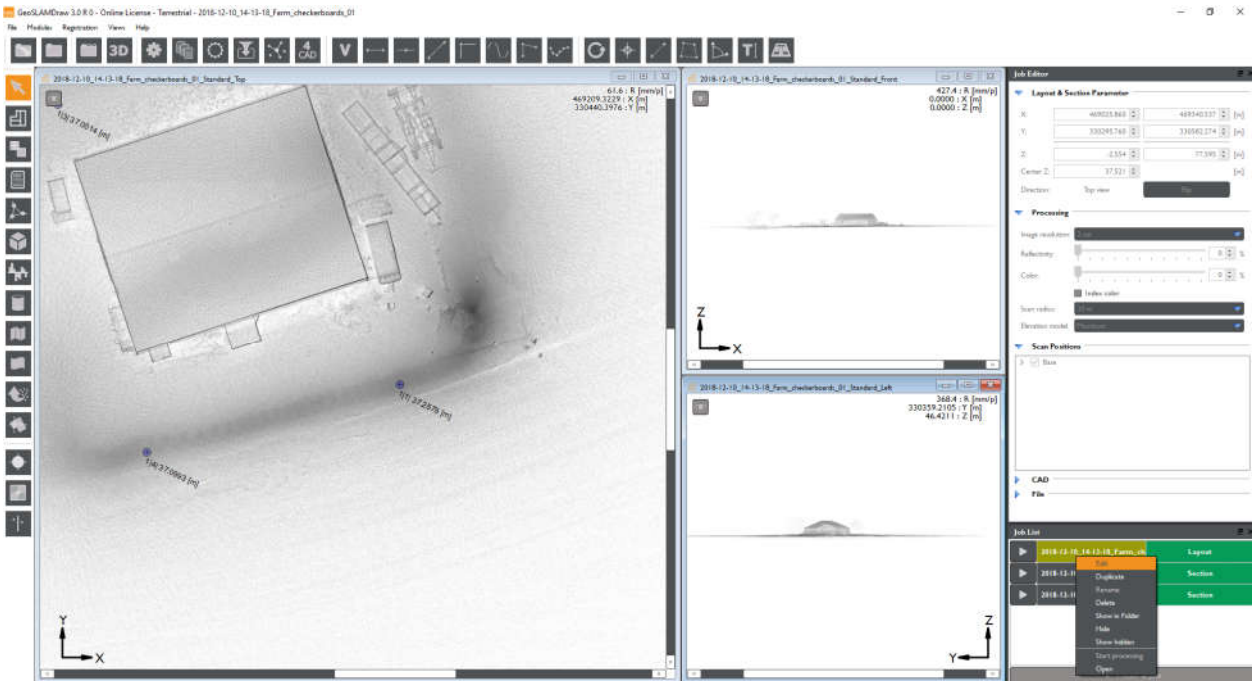
FIGURE 3. SPHERE AND CHECKERBOARD PHOTOGRAPHS

2. CHECKERBOARDS GEOREFERENCING GEOSLAM DRAW

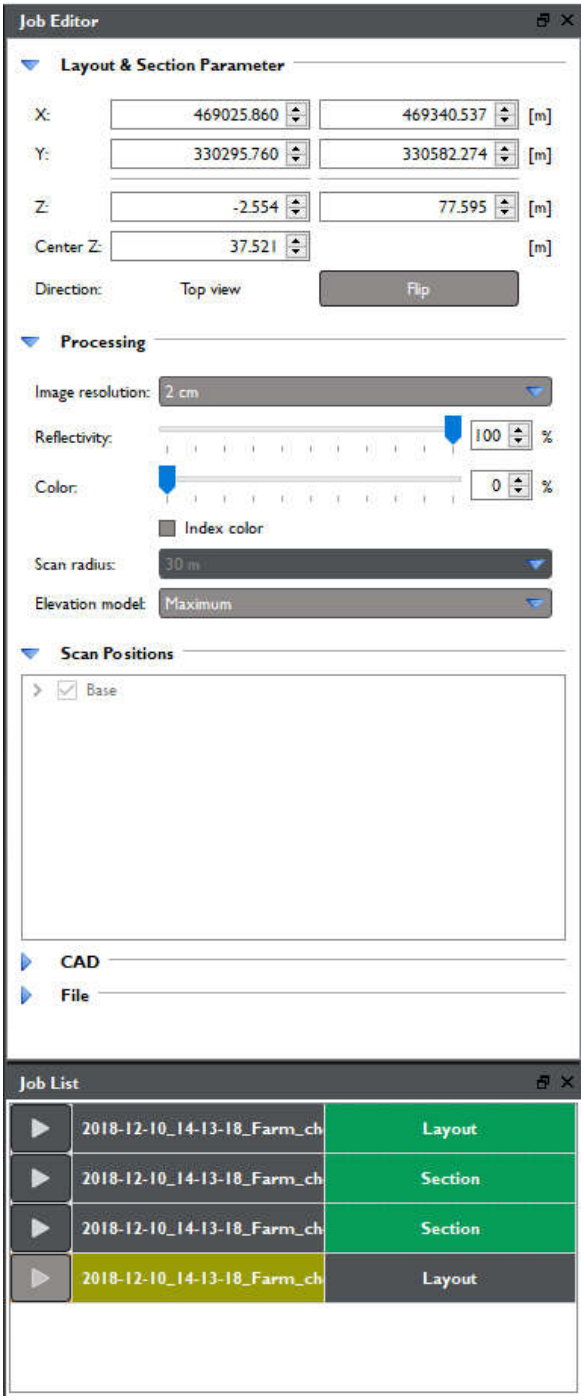
Example of Georeferencing using checkerboards and Global coordinates derived from Terrestrial Laser Scanner . Higher accuracy can be achieved by using more accurate method of measuring control point (total station, RTK). Calculation was done in Geoslam Draw package.

(a) View data in Reflectivity mode

Right click on the TOP View and select either Duplicate or Edit to set the Reflectivity to somewhere around 80-100% (check what works best for you).



(b) Change Reflectivity and Play the task



(c) Now you can see data in Reflectivity mode and you will be able to see checkerboard targets

(d) Select Add 3D Point and click on the middle of the checkerboard as accurately as you can.

(e) Place 3D points on each of your checkerboard targets.

FIGURE 4. GEOSLAM DRAW 3D POINT FITTED IN CHECKERBOARD.

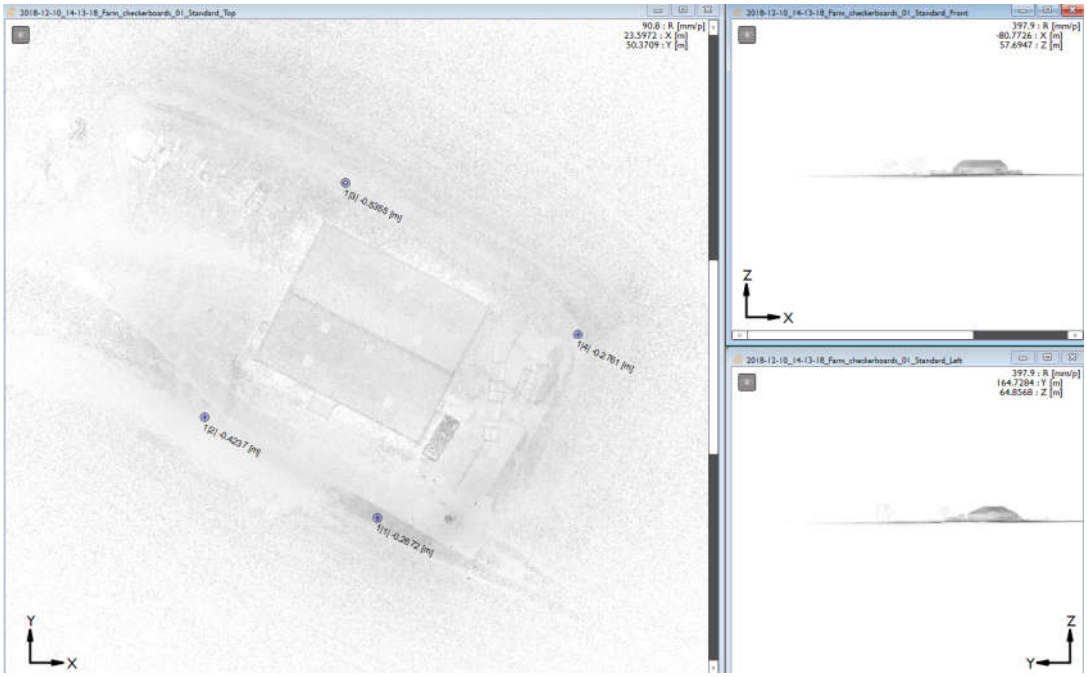
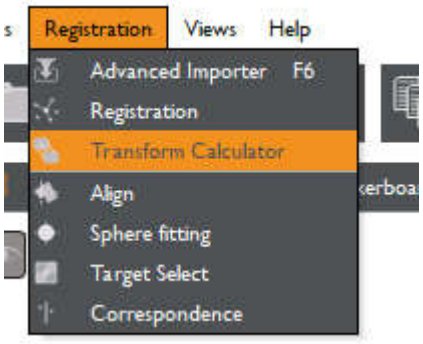


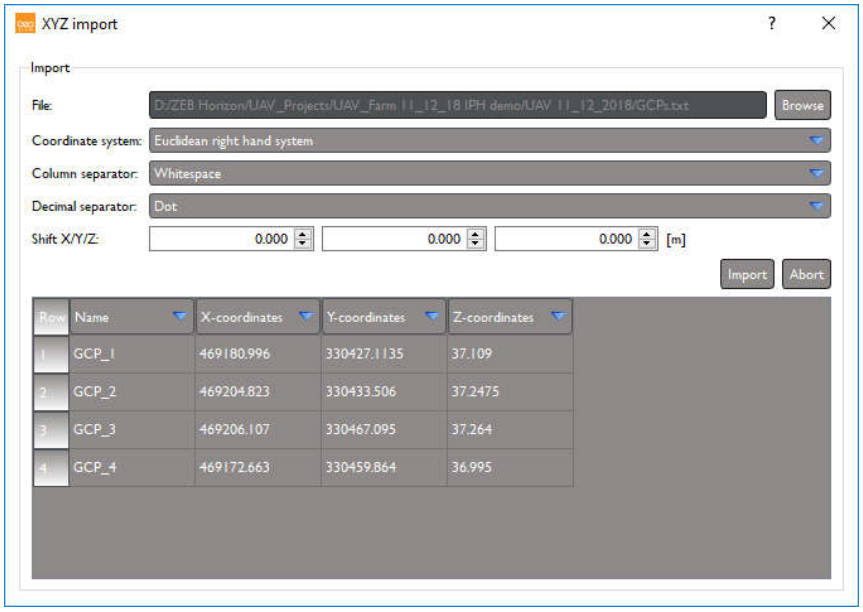
FIGURE 5. GEOSLAM DRAW ALL CONTROL POINTS DETECTED

(f) After all points are marked select Registration -> Transform Calculator



(g) All added 3D points should be on the list within Point Cloud System.

(h) Add your GCP in your Global Coordinate System. Save your file as .txt, .cor, .xyz



(i) Software will find automatically match between points within selected Max. distance (next to Find Constellation button). If the match cannot be made it might mean that there is either error on the 3D point entry or big error on one of the control points.

(j) Click Find Constellation to perform calculation

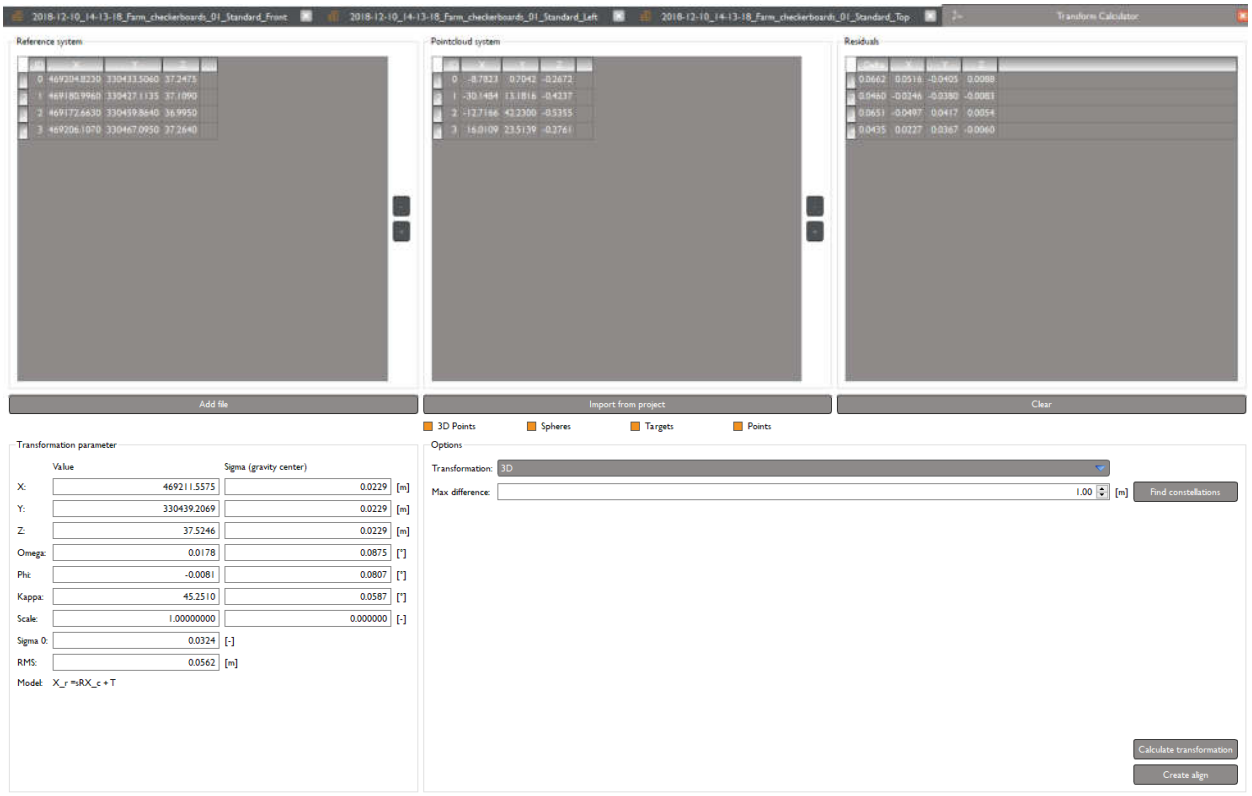


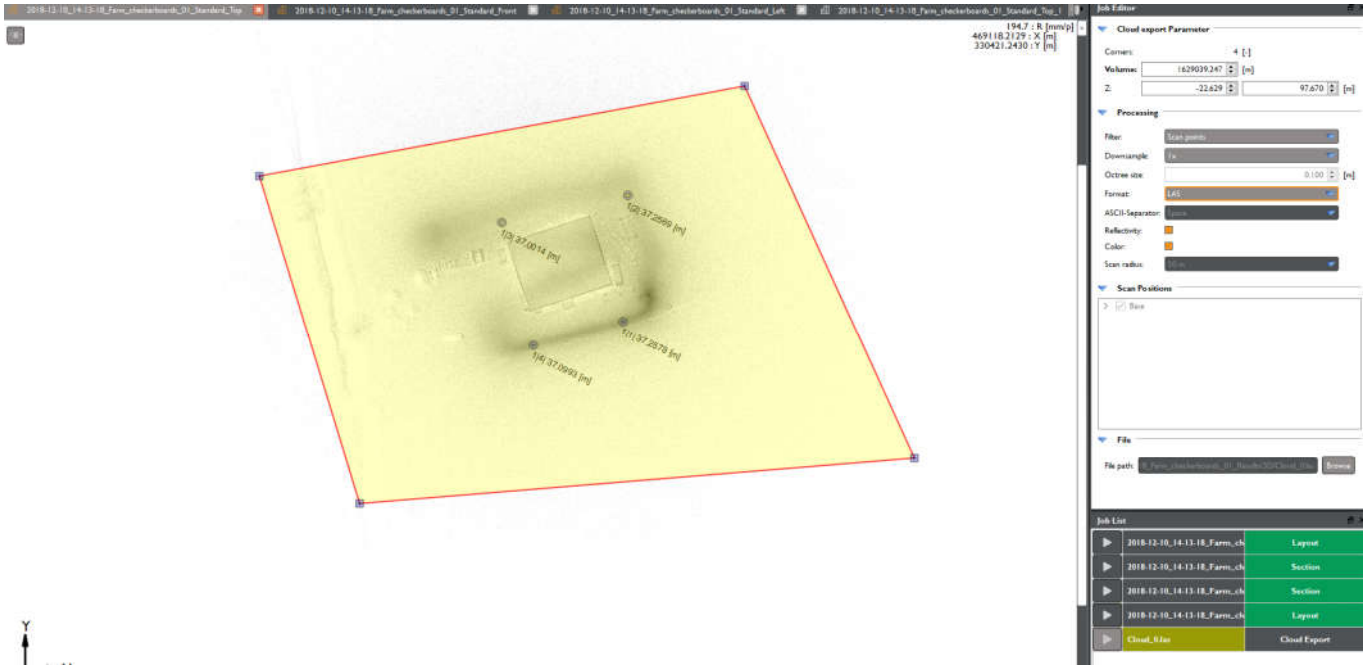
FIGURE 6. GEOSLAM DRAW GEOREFERENCING CALUCLATION

(k) Once you are happy with your RMS results click Create Align.

(l) All standard views will be automatically re-calculated into new coordinate system.

(m) Export new point cloud (using option below)

(n) Select Rectangle around entire point cloud in the main Top View



(o) Select file format and path where you want to save new file. Click Play button next to the task on the Job List to perform the operation.