Notes on Lee Adoyta Geraru Afar Ethiopia data set

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Original Photoscan processing was done with DNG images but they were too big to load here so we use the JPGs

WGS84 marker locations

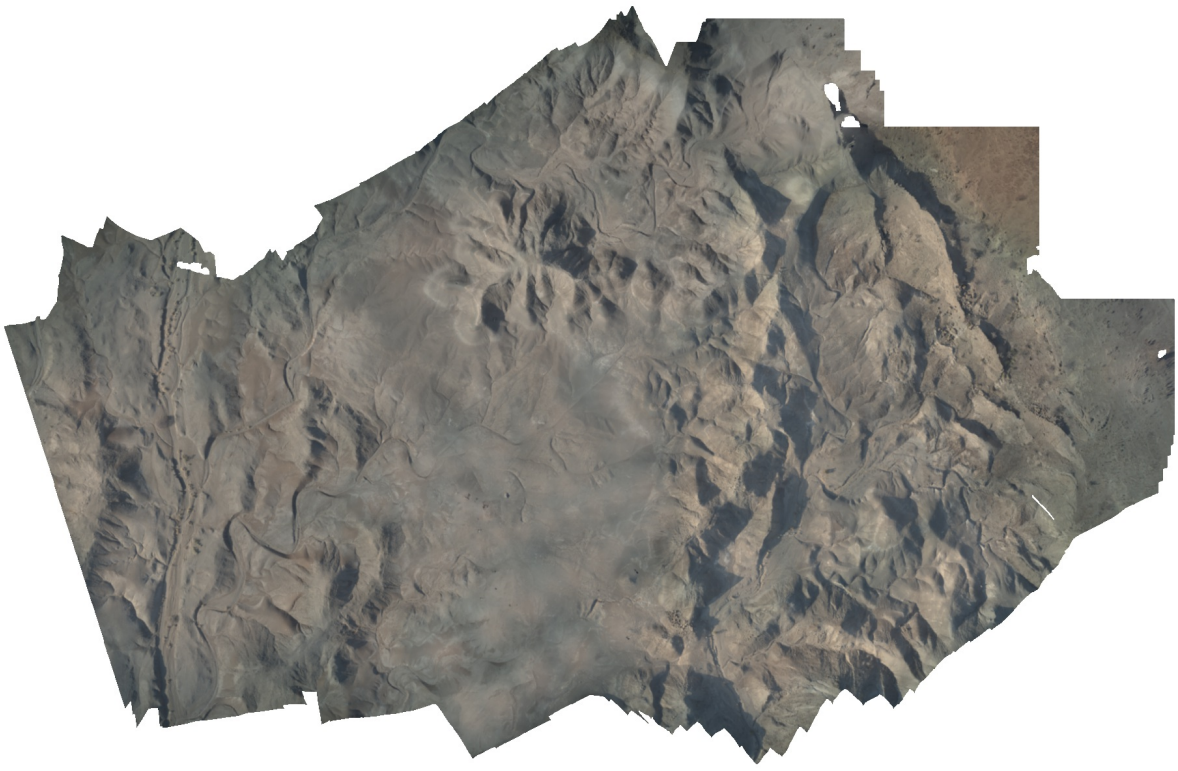
#	H rms	v rms	Lat	long	Elliptical elevation
1 revisit	0.111	0.146	11.35936	40.86109	454.213
2	0.109	0.152	11.35901	40.86137	452.031
3	0.107	0.115	11.35935	40.86163	453.261
4	0.102	0.12	11.35981	40.86177	455.328
5	0.204	0.19	11.36021	40.86165	452.891
6	0.15	0.164	11.36038	40.86107	457.996
7	0.124	0.16	11.36008	40.86089	451.418
8	0.118	0.156	11.35975	40.86092	451.308
9	0.095	0.15	11.35978	40.86129	451.964
10	0.114	0.15	11.35926	40.8605	454.114

We used an Arrow Gold with mostly several cm uncertainty for the positioning.

Agisoft PhotoScan LA6_highrez_report

Processing Report

23 April 2018



Survey Data

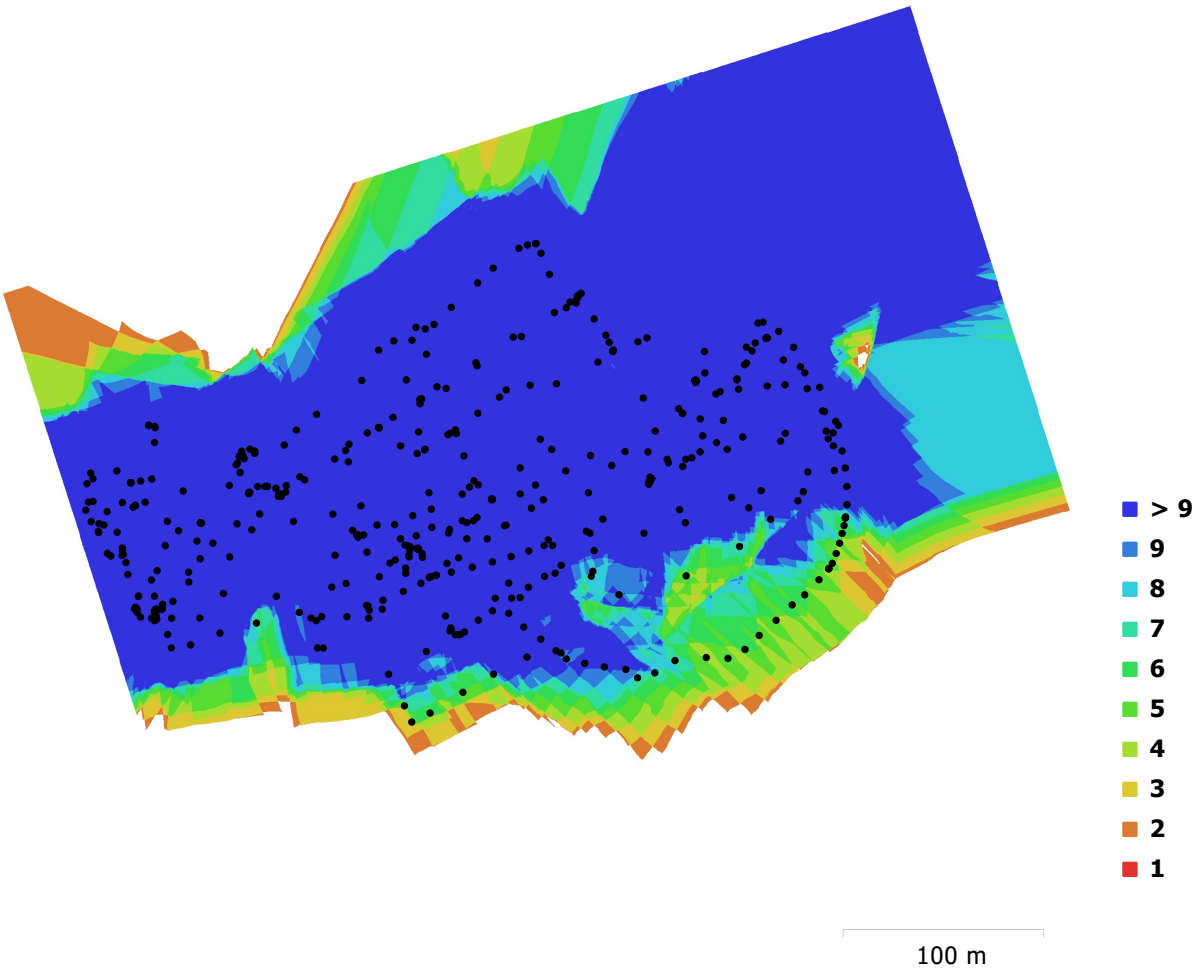


Fig. 1. Camera locations and image overlap.

Number of images:	504	Camera stations:	490
Flying altitude:	52.2 m	Tie points:	204,942
Ground resolution:	1.61 cm/pix	Projections:	1,415,846
Coverage area:	0.124 km²	Reprojection error:	2.3 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC230 (4.7 mm)	4048 x 3032	4.7 mm	1.55 x 1.55 µm	No

Table 1. Cameras.

Camera Calibration

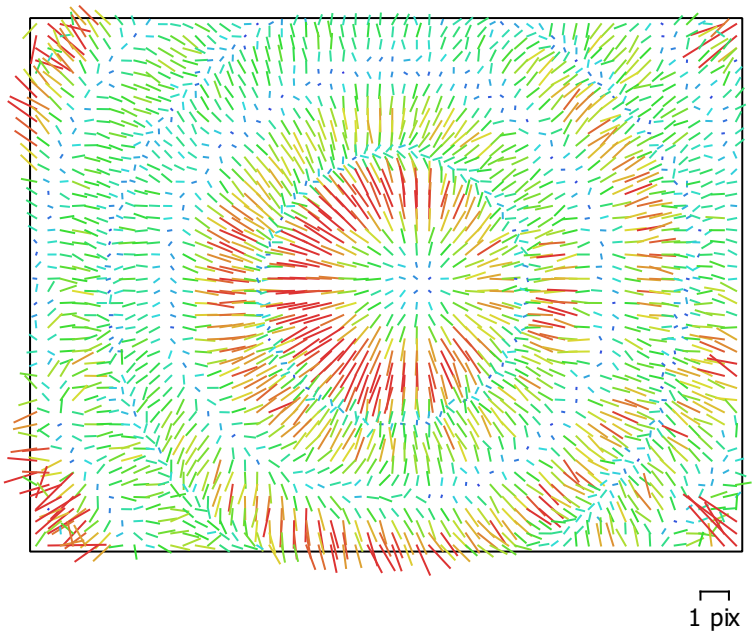


Fig. 2. Image residuals for FC230 (4.7 mm).

FC230 (4.7 mm)

504 images

Type	Resolution	Focal Length	Pixel Size
Frame	**4048 x 3032**	**4.7 mm**	**1.55 x 1.55 µm**

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
B1	**-0.350547**									
B2	**0.26021**									
K4	**-0.700305**									
F	**2935.08**	0.19	1.00	-0.01	-0.36	-0.20	0.10	-0.11	-0.04	0.22
Cx	**31.7054**	0.09		1.00	-0.03	0.01	-0.02	0.02	0.21	-0.03
Cy	**-3.07689**	0.11			1.00	0.03	0.00	0.00	-0.01	0.00
K1	**0.259454**	0.00013				1.00	-0.96	0.91	0.01	-0.04
K2	**-1.0052**	0.0004					1.00	-0.98	-0.01	-0.01
K3	**1.3451**	0.00038						1.00	0.01	0.00
P1	**0.000427945**	6.8e-06							1.00	-0.02
P2	**-0.000521995**	7.1e-06								1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

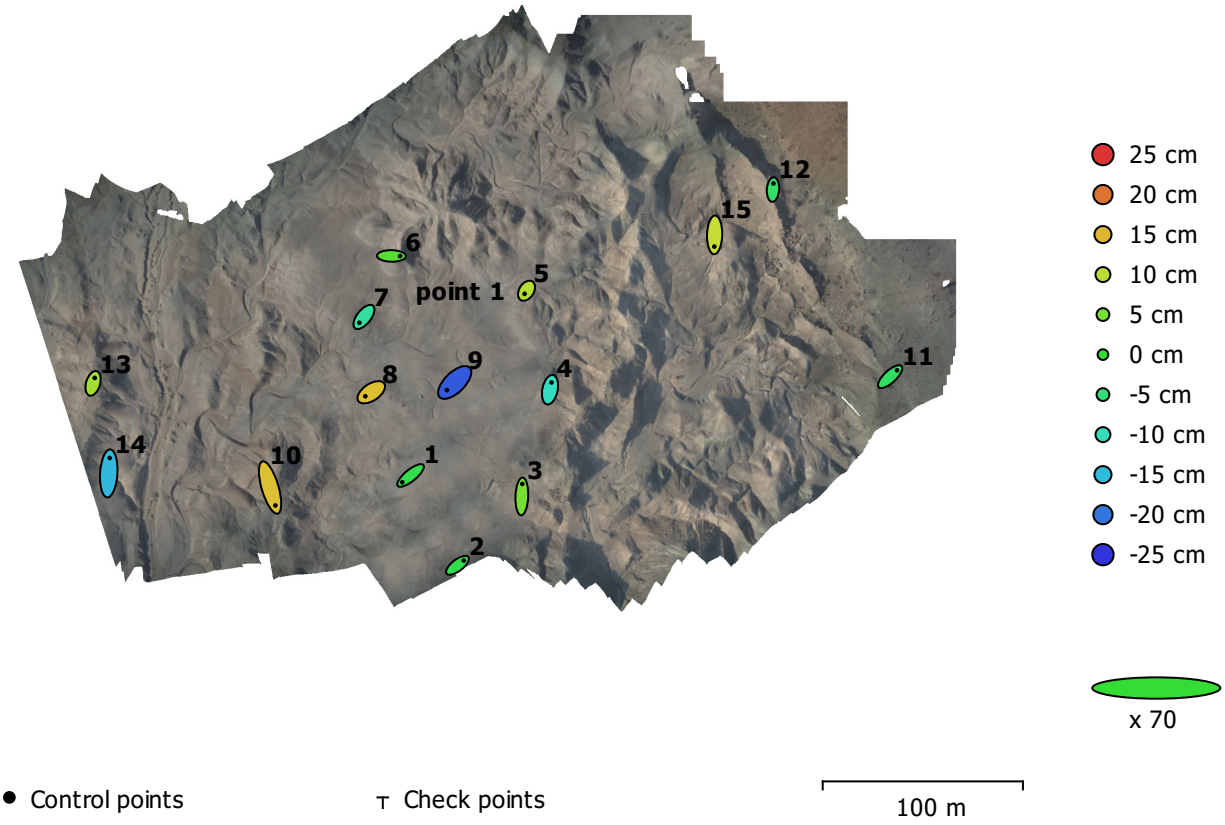


Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
15	7.25381	12.7587	10.5408	14.6766	18.0696

Table 3. Control points RMSE.
X - Longitude, Y - Latitude, Z - Altitude.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
1	-11.8962	-9.68589	-2.0094	15.4717	1.749 (8)
10	7.56137	-25.6644	14.5213	30.4418	2.378 (10)
11	9.86606	9.12344	-3.57487	13.9052	2.630 (7)
12	0.606214	8.71105	-3.84936	9.54293	2.550 (25)
13	2.34237	7.79578	7.91499	11.3538	4.858 (43)
14	1.35567	21.9419	-15.5741	26.9414	6.217 (41)
15	-0.435883	-16.7123	10.6594	19.8271	1.727 (29)
2	9.01628	6.85491	-1.92223	11.4882	0.487 (2)
3	0.689203	17.7915	4.85559	18.4551	1.240 (9)
4	2.0732	10.2633	-10.7496	15.0063	1.394 (15)
5	-2.78032	-4.40552	9.32719	10.6834	2.756 (12)
6	12.3438	-0.236691	2.25431	12.5501	2.193 (43)
7	-6.56598	-8.2745	-7.8862	13.1822	2.096 (11)
8	-8.52797	-5.7331	14.3791	17.6735	3.539 (26)
9	-11.1063	-10.9072	-22.3931	27.2721	4.988 (34)
Total	**7.25381**	**12.7587**	**10.5408**	**18.0696**	**3.796**

Table 4. Control points.
X - Longitude, Y - Latitude, Z - Altitude.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
point 1					11.781 (36)
Total					

Table 5. Check points.
X - Longitude, Y - Latitude, Z - Altitude.

Digital Elevation Model

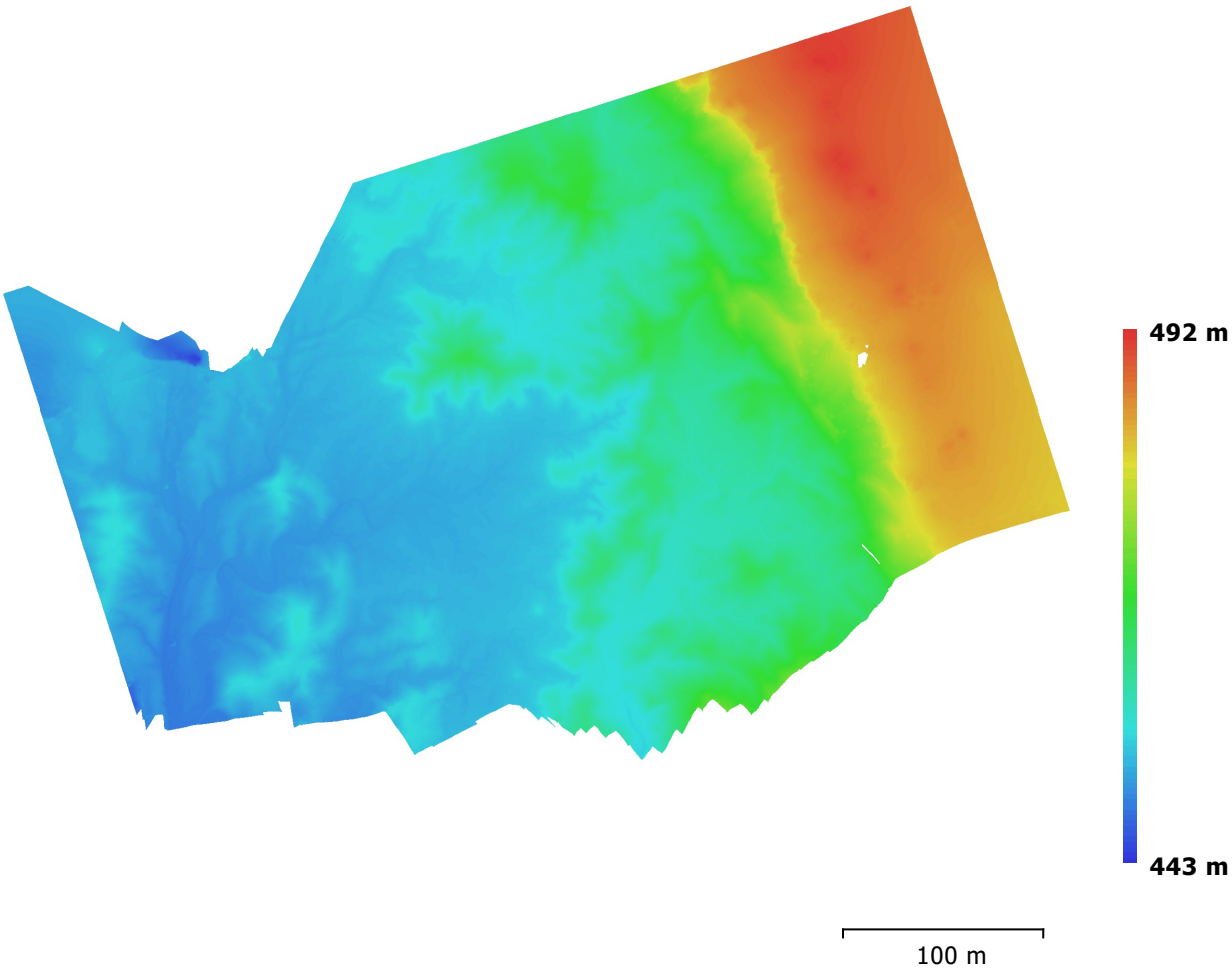


Fig. 4. Reconstructed digital elevation model.

Resolution:	3.21 cm/pix
Point density:	970 points/m²

Processing Parameters

General	
Cameras	504
Aligned cameras	490
Markers	16
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	204,942 of 289,176
RMS reprojection error	0.894704 (2.30326 pix)
Max reprojection error	48.8197 (102.832 pix)
Mean key point size	2.79905 pix
Effective overlap	9.08514
Alignment parameters	
Accuracy	High
Generic preselection	Yes
Reference preselection	No
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	2 hours 31 minutes
Alignment time	17 minutes 3 seconds
Optimization parameters	
Parameters	f, cx, cy, k1-k3, p1, p2
Fit rolling shutter	No
Optimization time	24 seconds
Dense Point Cloud	
Points	143,967,050
Reconstruction parameters	
Quality	High
Depth filtering	Mild
Depth maps generation time	1 days 1 hours
Dense cloud generation time	5 hours 48 minutes
Model	
Faces	28,675,828
Vertices	14,343,557
Texture	4,096 x 4,096, uint16
Reconstruction parameters	
Surface type	Height field
Source data	Dense
Interpolation	Enabled
Quality	High
Depth filtering	Mild
Face count	28,793,326
Processing time	13 minutes 56 seconds
Texturing parameters	
Mapping mode	Generic
Blending mode	Mosaic
Texture size	4,096 x 4,096
Enable color correction	No
Enable hole filling	Yes
UV mapping time	11 minutes 39 seconds
Blending time	31 minutes 0 seconds
DEM	
Size	17,316 x 14,578
Coordinate system	WGS 84 (EPSG::4326)
Reconstruction parameters	

Source data	Dense cloud
Interpolation	Enabled
Processing time	3 minutes 18 seconds
Orthomosaic	
Size	33,193 x 23,447
Coordinate system	WGS 84 (EPSG::4326)
Channels	3, uint16
Reconstruction parameters	
Blending mode	Mosaic
Surface	Mesh
Enable color correction	No
Enable hole filling	Yes
Processing time	1 hours 13 minutes
Software	
Version	1.3.2 build 4205
Platform	Windows 64