Agisoft Metashape

Processing Report

17 November 2023

Survey Data

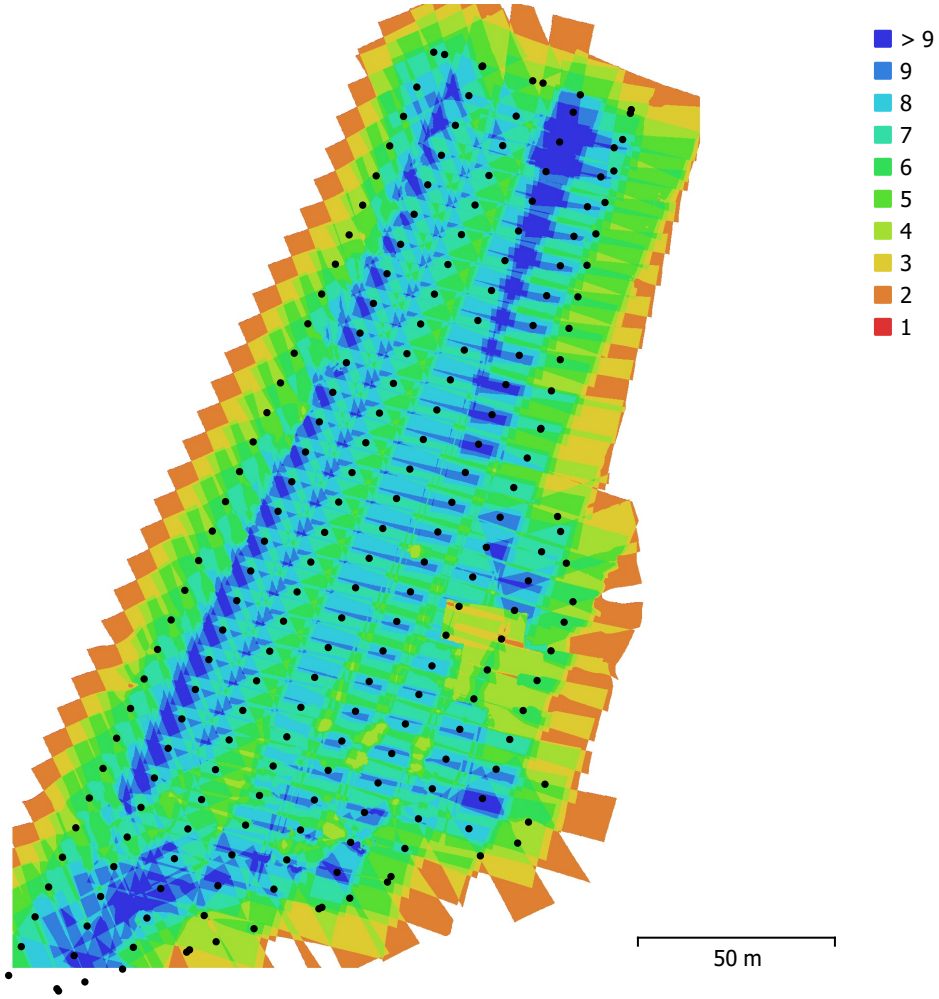

Fig. 1. Camera locations and image overlap.

Number of images:	222	Camera stations:	219
Flying altitude:	30.9 m	Tie points:	221,664
Ground resolution:	6.68 mm/pix	Projections:	717,311
Coverage area:	0.027 km²	Reprojection error:	0.992 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC6520, DJI MFT 15mm …	5272 x 2962	15 mm	3.58 x 3.58 µm	No

Table 1. Cameras.

Camera Calibration

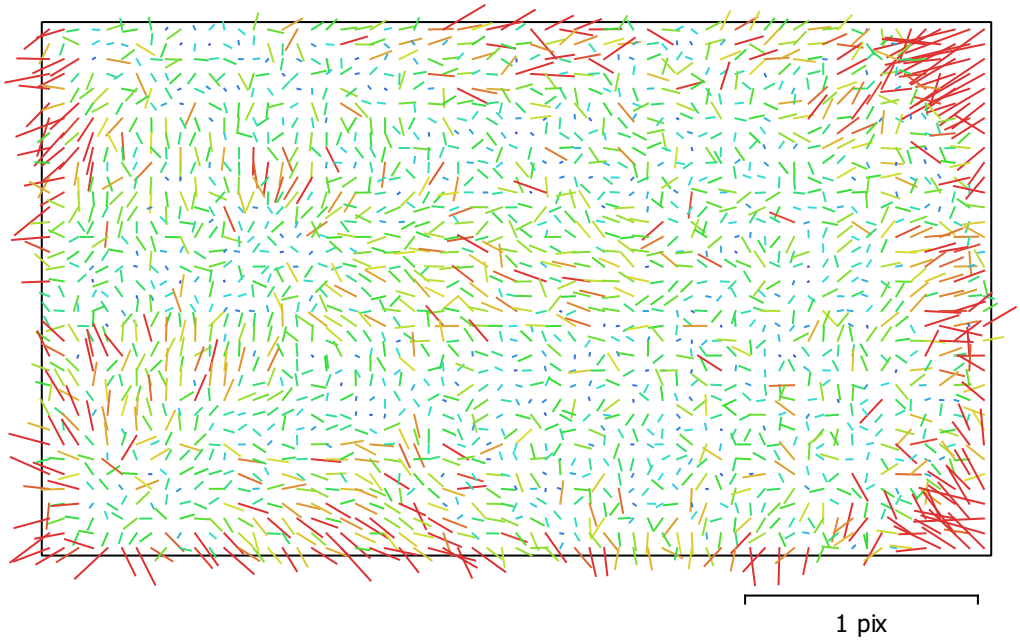

Fig. 2. Image residuals for FC6520, DJI MFT 15mm F1.7 ASPH (15mm).

FC6520, DJI MFT 15mm F1.7 ASPH (15mm)

222 images

Type	Resolution	Focal Length	Pixel Size
Frame	**5272 x 2962**	**15 mm**	**3.58 x 3.58 µm**

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	P1	P2
F	**4492.78**	4	1.00	0.33	0.03	-0.30	-0.03	-0.99	0.81	-0.28	-0.23	-0.04
Cx	**40.6114**	0.12		1.00	0.07	-0.17	-0.05	-0.33	0.28	-0.13	-0.39	-0.02
Cy	**-27.93**	0.083			1.00	0.00	-0.03	-0.03	0.01	0.01	-0.03	-0.47
B1	**-8.08578**	0.025				1.00	0.15	0.29	-0.25	0.11	0.01	0.02
B2	**0.164499**	0.028					1.00	0.03	-0.03	0.01	0.00	-0.06
K1	**-0.218979**	0.0004						1.00	-0.89	0.42	0.23	0.03
K2	**0.114385**	0.0005							1.00	-0.78	-0.20	-0.02
K3	**-0.0216217**	0.0004								1.00	0.11	-0.01
P1	**0.000176973**	4.1e-06									1.00	0.06
P2	**-0.000198823**	3.3e-06										1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

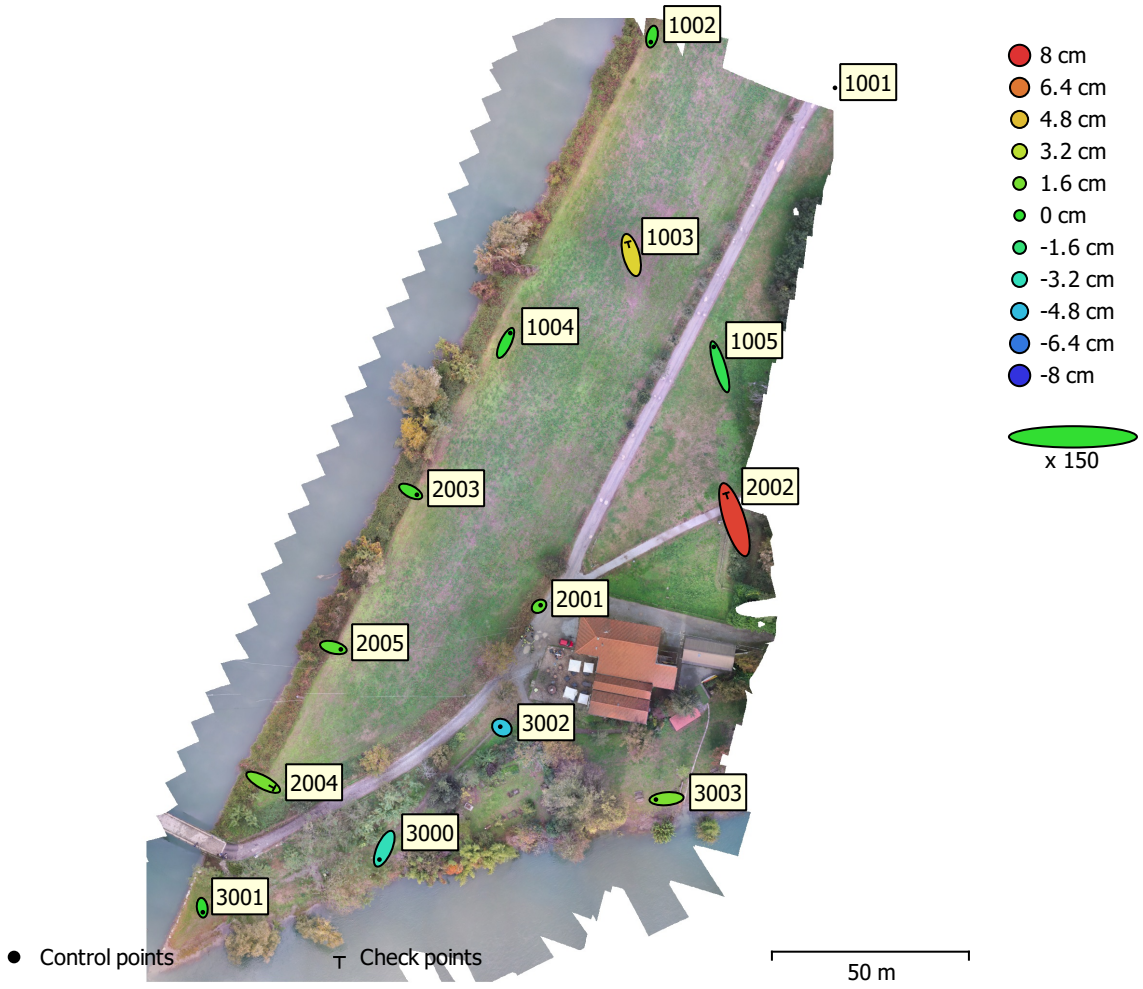

Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
10	1.83974	2.79141	1.90686	3.34314	3.84873

Table 3. Control points RMSE.
X - Easting, Y - Northing, Z - Altitude.

Count	X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
3	2.79598	5.8869	5.14029	6.51714	8.30034

Table 4. Check points RMSE.
X - Easting, Y - Northing, Z - Altitude.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
1001					
1002	-0.410898	-1.84712	0.26495	1.91073	0.162 (2)
1004	1.60213	3.35311	-0.161763	3.71973	0.883 (8)
1005	-2.04595	6.73732	-0.729828	7.07884	0.514 (6)
2001	0.515478	0.366206	1.01747	1.19794	0.883 (8)
2003	2.11148	-1.12915	0.5031	2.44672	0.853 (10)
2005	2.51579	-0.636502	0.965576	2.76888	0.541 (10)
3000	-1.6325	-3.6797	-3.12674	5.09723	0.515 (7)
3001	0.19931	-1.52708	-0.0394682	1.54054	0.569 (7)
3002	-0.551107	0.31923	-4.55785	4.60213	0.520 (8)
3003	-3.58651	-0.290702	1.72026	3.98834	0.456 (7)
Total	**1.83974**	**2.79141**	**1.90686**	**3.84873**	**0.663**

Table 5. Control points.

X - Easting, Y - Northing, Z - Altitude.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
1003	-1.18612	4.432	4.24353	6.24956	1.180 (6)
2002	-2.85892	8.95978	7.66714	12.1341	0.920 (5)
2004	3.72455	-2.01161	1.57323	4.51596	0.700 (10)
Total	**2.79598**	**5.8869**	**5.14029**	**8.30034**	**0.912**

Table 6. Check points.

X - Easting, Y - Northing, Z - Altitude.

Digital Elevation Model

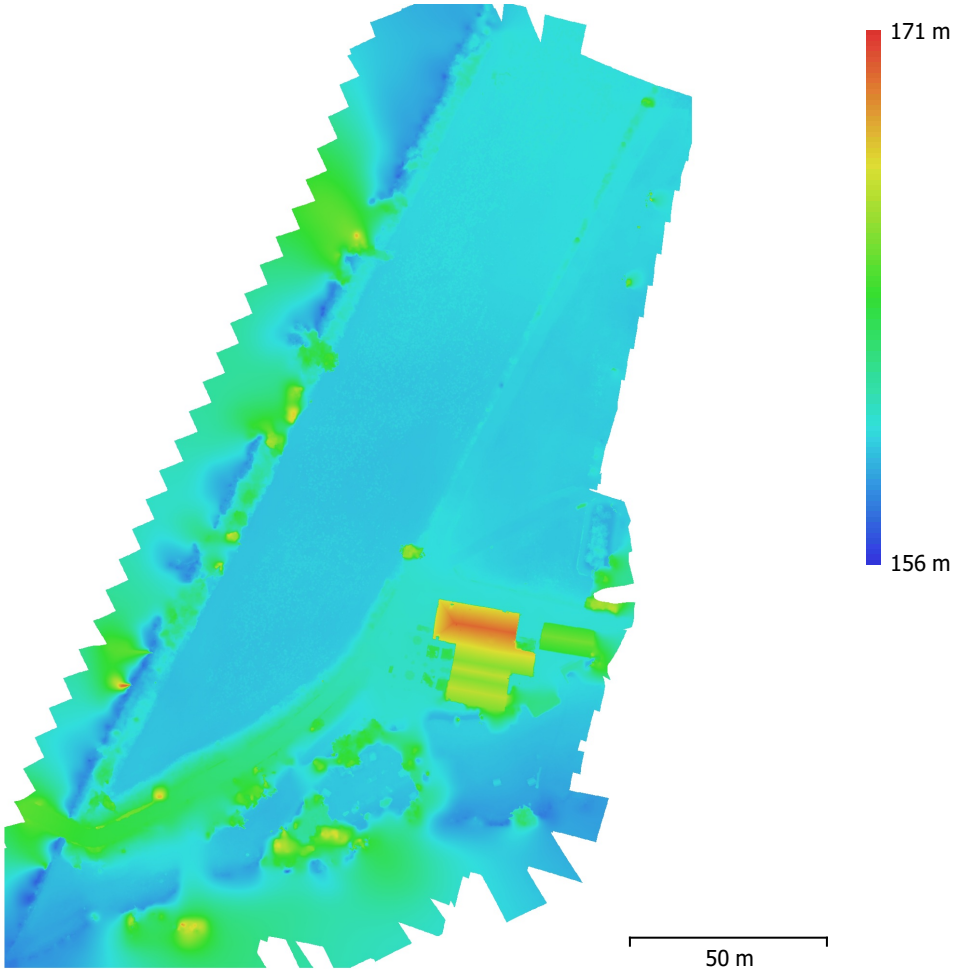

Fig. 4. Reconstructed digital elevation model.

Resolution:	2.67 cm/pix
Point density:	0.14 points/cm²

Processing Parameters

General	
Cameras	222
Aligned cameras	219
Markers	14
Coordinate system	WGS 84 / UTM zone 32N (EPSG::32632)
Rotation angles	Yaw, Pitch, Roll
Tie Points	
Points	221,664 of 240,597
RMS reprojection error	0.148769 (0.99158 pix)
Max reprojection error	0.846156 (28.6045 pix)
Mean key point size	5.93302 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	3.31443
Alignment parameters	
Accuracy	Medium
Generic preselection	No
Reference preselection	Source
Key point limit	40,000
Key point limit per Mpx	1,000
Tie point limit	4,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	18 minutes 59 seconds
Matching memory usage	205.85 MB
Alignment time	1 minutes 36 seconds
Alignment memory usage	245.66 MB
Optimization parameters	
Parameters	f, b1, b2, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	2 seconds
Date created	2023:11:16 12:32:12
Software version	2.0.2.16404
File size	17.96 MB
Depth Maps	
Count	218
Depth maps generation parameters	
Quality	Medium
Filtering mode	Aggressive
Max neighbors	16
Processing time	7 minutes 5 seconds
Memory usage	1.67 GB
Date created	2023:11:16 17:37:31
Software version	2.0.2.16404
File size	240.63 MB
Point Cloud	
Points	27,347,905
Coordinate precision	6.68 mm
Point attributes	

Color	3 bands, uint8
Normal	
Confidence	2 - 13
Point classes	
Ground	14,184,833
High Vegetation	1,461,501
Building	2,220,041
Road Surface	8,134,170
Car	269,777
Man-made Object	1,077,583
Depth maps generation parameters	
Quality	Medium
Filtering mode	Aggressive
Max neighbors	16
Processing time	7 minutes 5 seconds
Memory usage	1.67 GB
Point cloud generation parameters	
Processing time	1 minutes 53 seconds
Memory usage	3.26 GB
Points classification parameters	
Confidence	0
Classification time	2 minutes 27 seconds
Classification memory usage	5.47 GB
Date created	2023:11:17 12:28:02
Software version	2.0.2.16404
File size	451.52 MB
DEM	
Size	6,522 x 9,150
Coordinate system	WGS 84 / UTM zone 32N (EPSG::32632)
Reconstruction parameters	
Source data	Point cloud
Interpolation	Enabled
Processing time	27 seconds
Memory usage	308.66 MB
Date created	2023:11:17 13:04:51
Software version	2.0.2.16404
File size	136.66 MB
Orthomosaic	
Size	17,414 x 24,431
Coordinate system	WGS 84 / UTM zone 32N (EPSG::32632)
Colors	3 bands, uint8
Reconstruction parameters	
Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Enable ghosting filter	No
Processing time	3 minutes 3 seconds
Memory usage	836.62 MB
Date created	2023:11:17 14:07:29
Software version	2.0.2.16404
File size	1.63 GB
System	
Software name	Agisoft Metashape Professional
Software version	2.0.2 build 16404
OS	Windows 64 bit
RAM	15.78 GB

CPU	Intel(R) Core(TM) i7-10700 CPU @ 2.90GHz
GPU(s)	Intel(R) UHD Graphics 630 Quadro P1000