

Report Vidoc Cappella 10

Processing Report

01 October 2024



Survey Data

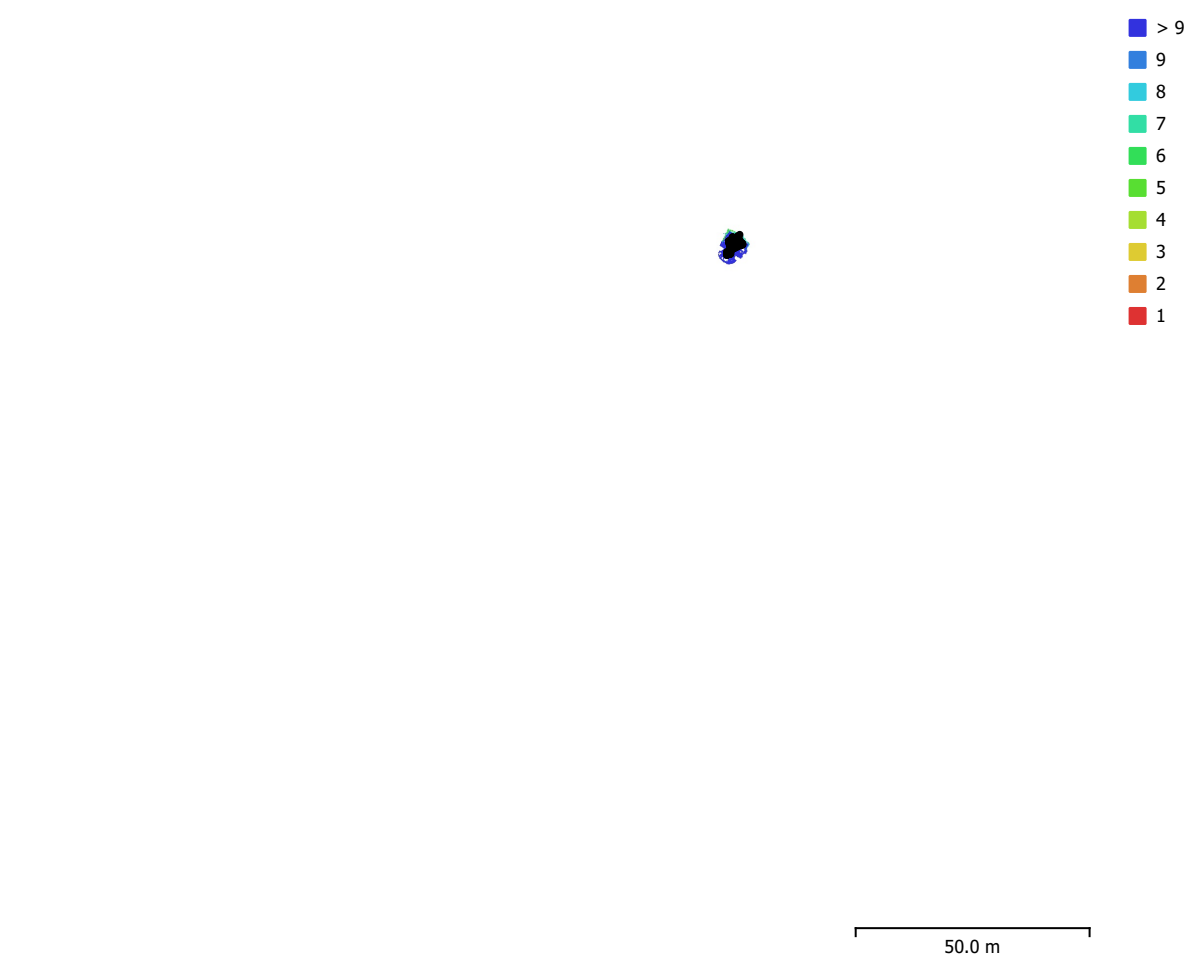


Fig. 1. Camera locations and image overlap.

Number of images:	461	Camera stations:	461
Flying altitude:	1.45 m	Tie points:	286,534
Ground resolution:	0.562 mm/pix	Projections:	1,293,885
Coverage area:	30.4 m ²	Reprojection error:	1.94 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
PIX4Dcatch.iPhone16.1.viDoc, i...	4224 x 2376	3.32307 mm	1.18 x 1.18 μm	Yes

Table 1. Cameras.

Camera Calibration

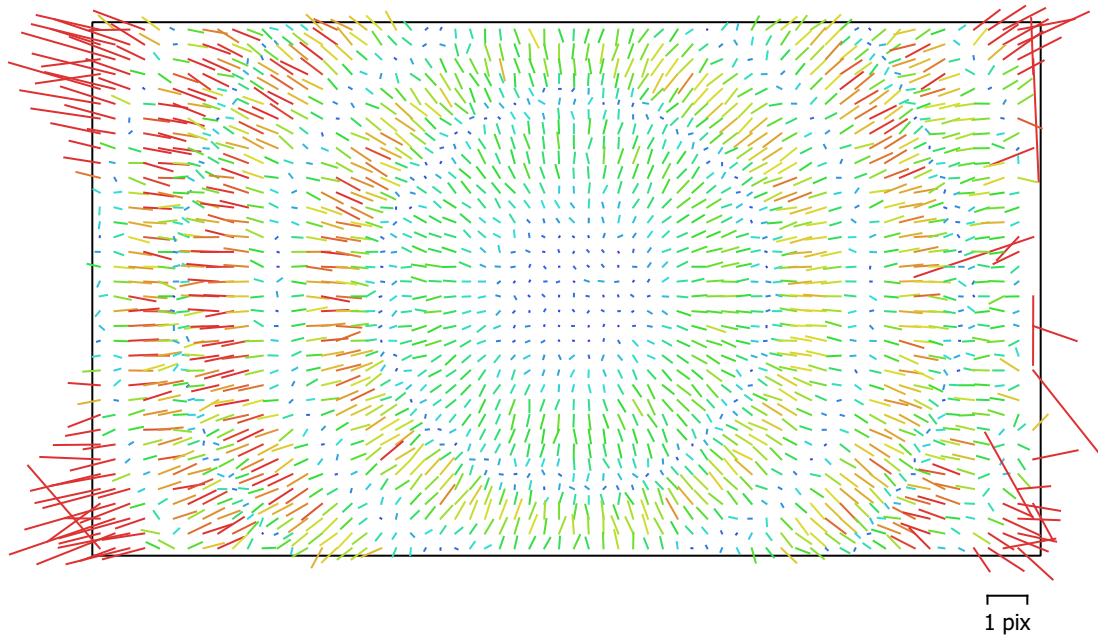


Fig. 2. Image residuals for PIX4Dcatch.iPhone16.1.viDoc, iOS (3.32307mm).

PIX4Dcatch.iPhone16.1.viDoc, iOS (3.32307mm)

461 images, precalibrated

Type	Resolution	Focal Length	Pixel Size
Frame	4224 x 2376	3.32307 mm	1.18 x 1.18 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	2814.32	0.074	1.00	0.00	0.05	-0.15	0.16	-0.10	0.02	0.05
Cx	7.43164	0.13		1.00	-0.05	-0.04	0.05	-0.07	0.91	-0.05
Cy	4.83273	0.14			1.00	-0.01	0.01	-0.01	-0.07	0.93
K1	0.185586	0.00013				1.00	-0.97	0.91	-0.03	-0.01
K2	-0.537926	0.00046					1.00	-0.98	0.04	0.01
K3	0.475566	0.00051						1.00	-0.05	-0.01
P1	-0.000567027	1.3e-05							1.00	-0.06
P2	0.000123011	1.5e-05								1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Locations

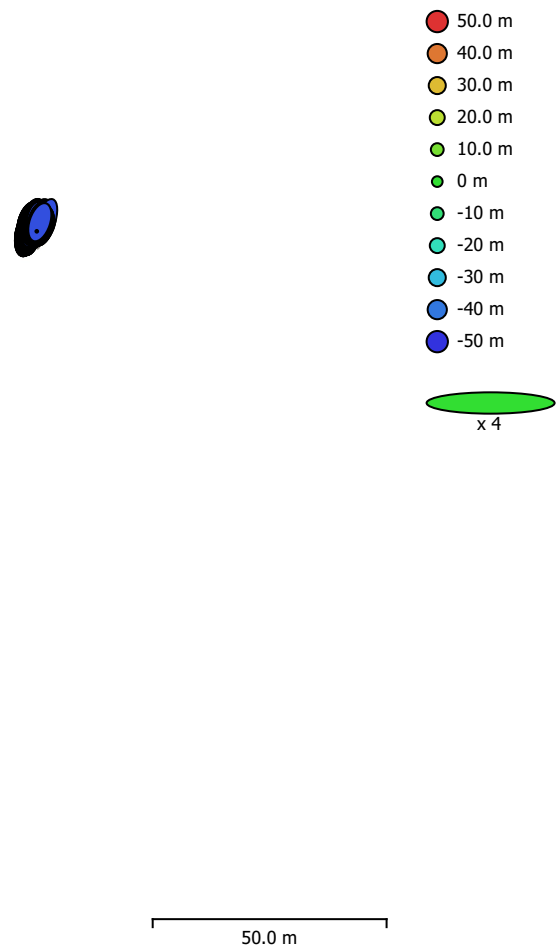


Fig. 3. Camera locations and error estimates.
 Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
 Estimated camera locations are marked with a black dot.

X error (m)	Y error (m)	Z error (m)	XY error (m)	Total error (m)
0.264327	0.992013	45.8441	1.02663	45.8556

Table 3. Average camera location error.
 X - Easting, Y - Northing, Z - Altitude.

Ground Control Points

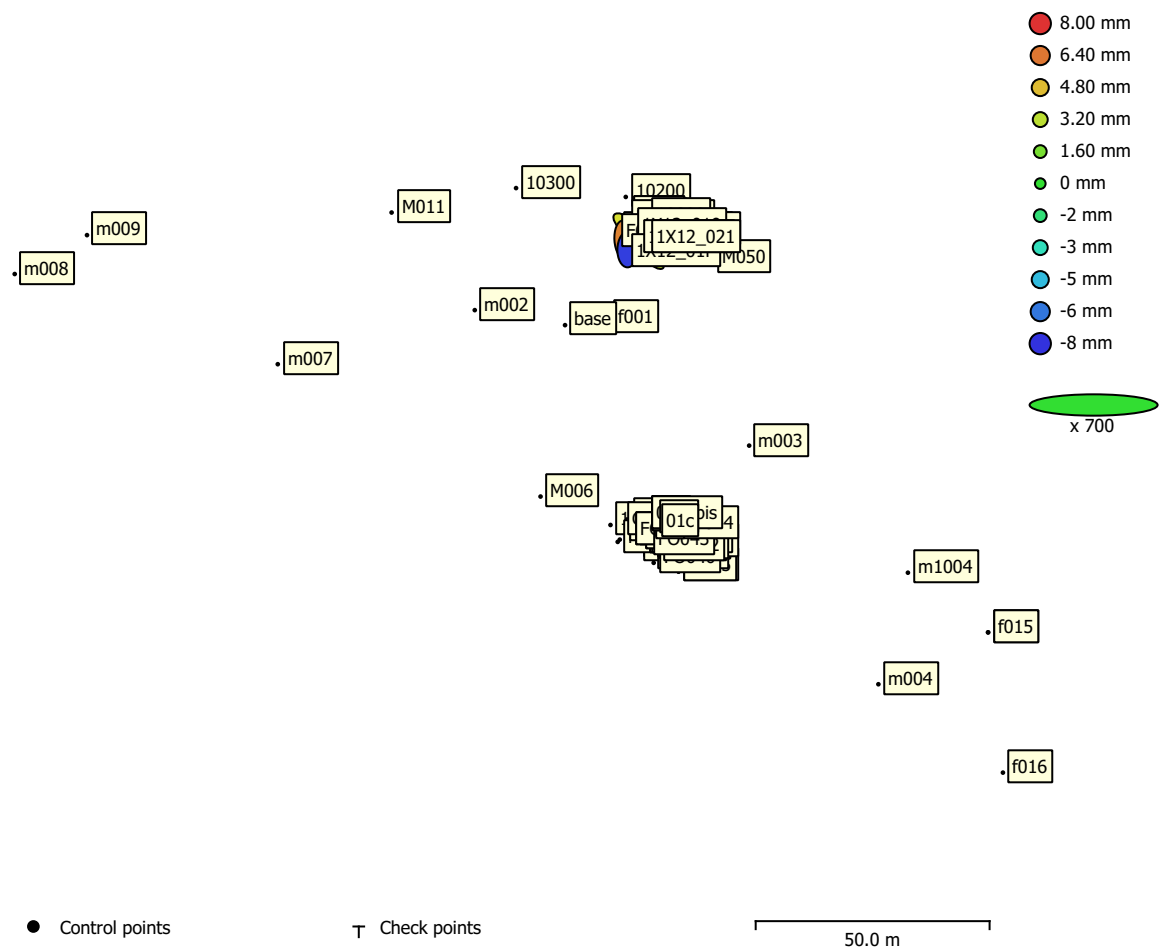


Fig. 4. GCP locations and error estimates.

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 (mm)	Y error (mm)	Z error (mm)	XY error (mm)	Total (mm)
4	3.97891	5.37749	5.5065	6.68948	8.66433

Table 4. Control points RMSE.

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

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
M010					
M011					
m009					
m008					
m007					
M006					
m013					
M005					
m004					
f014					
f015					
m1004					
m003					
f001					
base					
m002					
f016					
M050					
1601					
1602					
CB1610					
CB1611					
CB1612					
CB1613					
CB1614					
FO1615					
FO1616					
FO1617					
FO1618					
FO1619					
FO1620					
FO1621					

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
FO1622					
FO1623					
CG1640					
CB030					
CG031					
CB032					
CB033					
FO034					
FO035					
FO036					
FO037					
FO038					
FO039					
FO040					
FO041					
FO042					
FO043					
FO044					
15					
16					
11					
12					
13					
14					
01b					
01a					
01a_bis					
01e					
01c					
10100					
10200					
CB60					
CB61					

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
CB62					
FO64					
FO65					
FO66					
FO67					
FO68					
CB69					
FO70					
FO71					
FO72					
FO73					
FO74					
FO75					
10300					
CB80					
CB81					
CB82					
FO83					
FO84					
FO85					
FO86					
FO87					
FO88					
10800					
1X12_017					
1X12_018	5.3602	-4.54336	3.83477	8.00496	0.415 (5)
1X12_019	0.401122	-6.05137	6.10932	8.60835	0.600 (17)
1X12_01F					
1X12_01D	0.136173	4.62272	-7.73383	9.01111	0.536 (11)
1X12_021	-5.86648	6.08597	3.07327	8.99442	0.506 (15)
Total	3.97891	5.37749	5.5065	8.66433	0.540

Table 5. Control points.
X - Easting, Y - Northing, Z - Altitude.

Digital Elevation Model

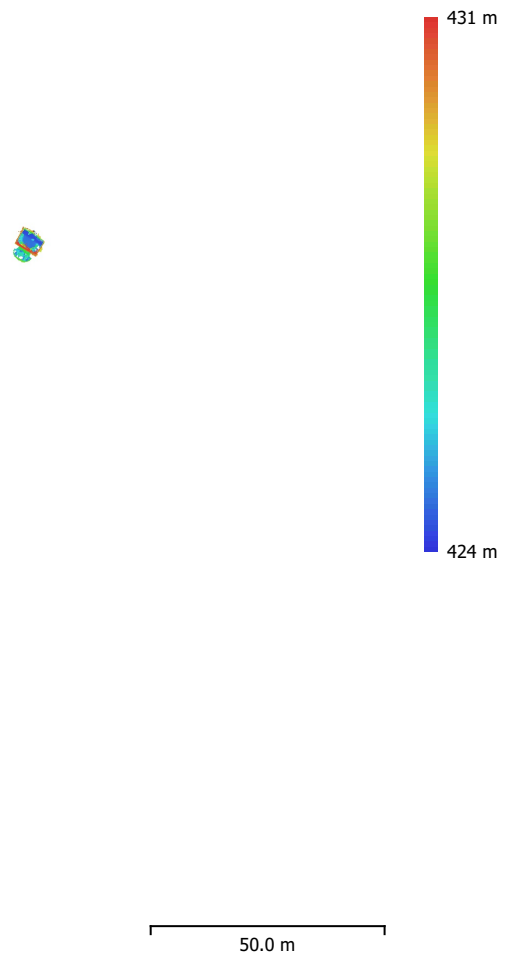


Fig. 5. Reconstructed digital elevation model.

Resolution: unknown

Point density: unknown

Processing Parameters

General

Images	461
Aligned images	461
Markers	103
Coordinate system	WGS 84 / UTM zone 32N (EPSG::32632)
Camera coordinate system	WGS 84 (EPSG::4326)
Marker coordinate system	WGS 84 / UTM zone 32N (EPSG::32632)
Rotation angles	Yaw, Pitch, Roll

Tie Points

Points	286,534 of 400,787
RMS reprojection error	0.252938 (1.94186 pix)
Max reprojection error	1.71467 (73.3652 pix)
Mean key point size	8.13578 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	4.47612

Alignment parameters

Accuracy	Medium
Generic preselection	Yes
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	Yes
Matching time	1 minutes 18 seconds
Matching memory usage	577.91 MB
Alignment time	8 minutes 23 seconds
Alignment memory usage	380.91 MB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Exclude corners	No
Optimization time	8 seconds
Date created	2024:10:01 18:44:51
Software version	2.1.3.18817
File size	35.14 MB

Depth Maps

Count	461
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Max neighbors	16
Processing time	22 minutes 8 seconds
Memory usage	3.10 GB
Date created	2024:10:01 19:42:40
Software version	2.1.3.18817
File size	790.65 MB

Point Cloud

Points	93,834,909
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Point attributes

Color	3 bands, uint8
Normal	

Point classes	
Created (never classified)	93,834,909
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Max neighbors	16
Processing time	22 minutes 8 seconds
Memory usage	3.10 GB
Point cloud generation parameters	
Source data	Depth maps
Processing time	40 minutes 18 seconds
Memory usage	8.93 GB
Date created	2024:10:01 20:22:58
Software version	2.1.3.18817
File size	1.21 GB
System	
Software name	Agisoft Metashape Professional
Software version	2.1.3 build 18817
OS	Windows 64 bit
RAM	31.77 GB
CPU	11th Gen Intel(R) Core(TM) i7-11800H @ 2.30GHz
GPU(s)	Intel(R) UHD Graphics NVIDIA GeForce RTX 3060 Laptop GPU