Fagus_sylvatica_1N

Processing Report

07 November 2018

Survey Data

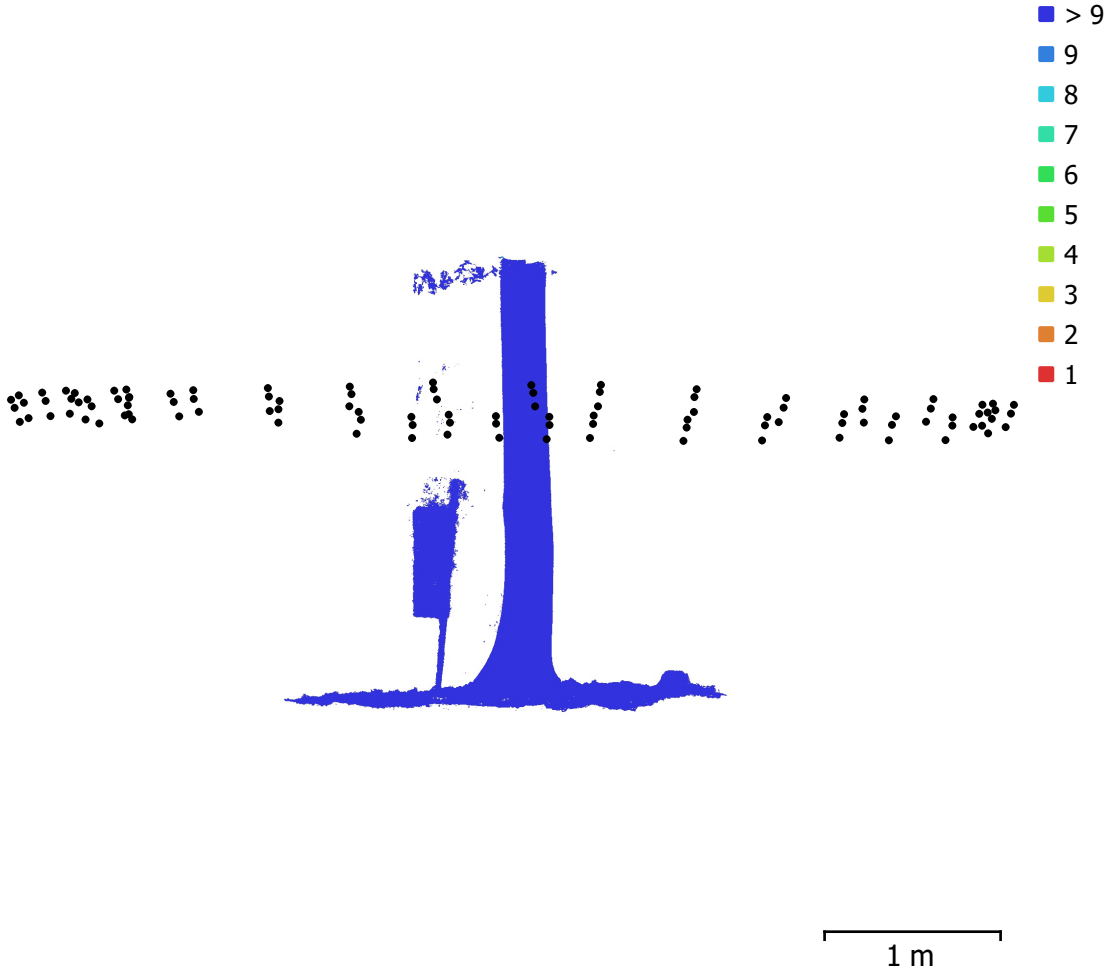

Fig. 1. Camera locations and image overlap.

Number of images:	108	Camera stations:	108
Flying altitude:	4.92 m	Tie points:	146,338
Ground resolution:	0.334 mm/pix	Projections:	383,383
Coverage area:	1.14 m²	Reprojection error:	0.706 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
Canon EOS 70D (35 mm)	5472 x 3648	35 mm	4.17 x 4.17 µm	No

Table 1. Cameras.

Camera Calibration

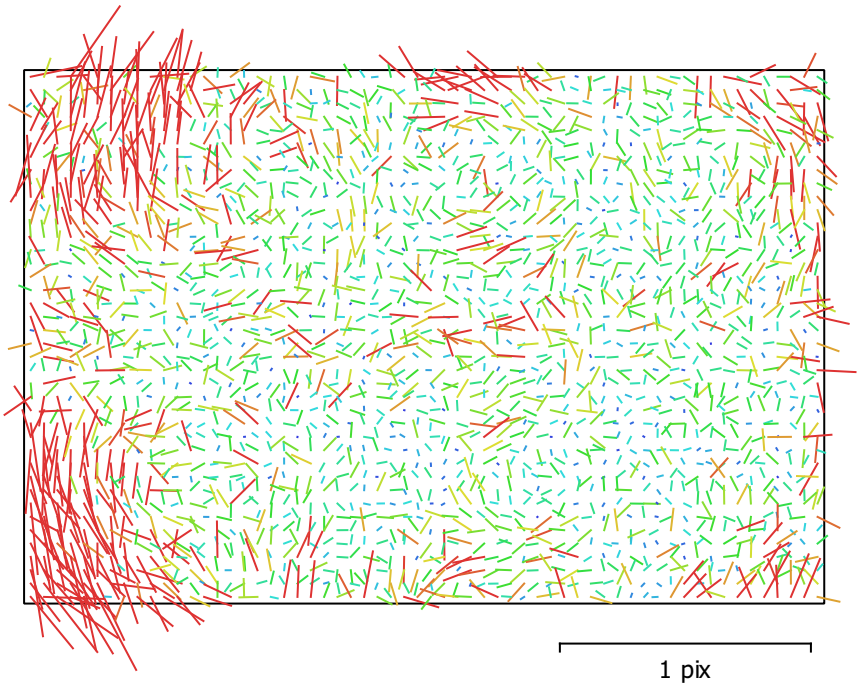

Fig. 2. Image residuals for Canon EOS 70D (35 mm).

Canon EOS 70D (35 mm)

108 images

Type	Resolution	Focal Length	Pixel Size
Frame	**5472 x 3648**	**35 mm**	**4.17 x 4.17 µm**

	Value	Error	F	B2	K1	K2	P1	P2
F	**8457.47**	0.5	1.00	0.02	0.28	-0.02	-0.18	0.00
B2	**3.9811**	0.098		1.00	0.01	-0.00	-0.02	-0.16
K1	**-0.0777741**	0.00012			1.00	-0.93	-0.06	0.01
K2	**0.0836679**	0.00078				1.00	0.03	-0.01
P1	**0.000831575**	4.8e-06					1.00	0.01
P2	**0.000588066**	4e-06						1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

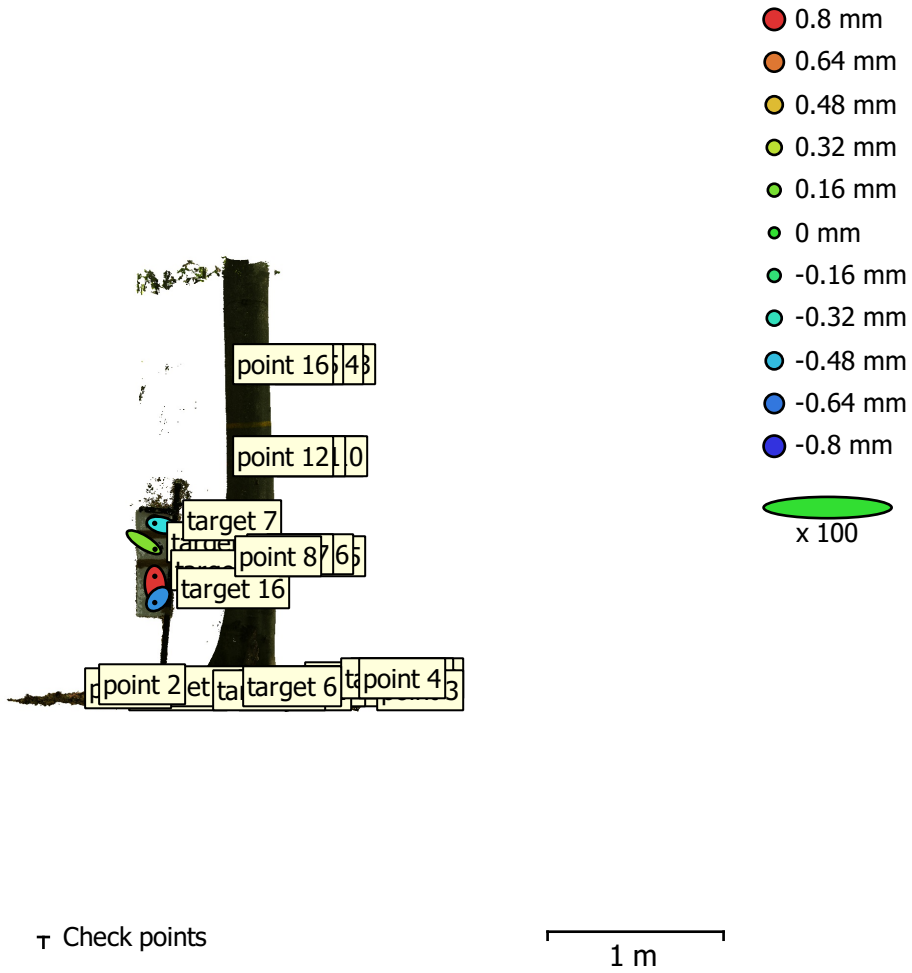

Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (mm)	Y error (mm)	Z error (mm)	XY error (mm)	Total (mm)
4	0.778319	0.671404	0.539765	1.02789	1.161

Table 3. Control points RMSE.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
target 8	1.26488	-0.794137	0.187414	1.50523	1.479 (32)
target 15	-0.0700002	0.984405	0.794488	1.26695	1.004 (46)
target 16	-0.369207	-0.399586	-0.582954	0.797382	1.049 (31)
target 7	-0.825823	0.209184	-0.399017	0.940721	1.057 (91)
Total	**0.778319**	**0.671404**	**0.539765**	**1.161**	**1.123**

Table 4. Control points.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
target 1					1.132 (19)
target 2					1.125 (7)
target 4					1.198 (22)
target 5					1.174 (18)
target 9					1.185 (16)
target 10					1.100 (16)
target 11					1.164 (32)
target 12					1.144 (25)
target 13					1.244 (36)
target 14					1.257 (37)
target 6					1.990 (50)
point 1					0.812 (25)
point 2					9.964 (23)
point 3					30.604 (43)
point 4					6.086 (50)
point 5					0.004 (107)
point 6					0.004 (108)
point 7					0.004 (108)
point 8					0.004 (108)
point 9					0.004 (72)
point 10					0.004 (72)
point 11					0.004 (72)
point 12					0.004 (72)

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 13					0.003 (62)
point 14					0.003 (61)
point 15					0.004 (64)
point 16					0.004 (63)
Total					

Table 5. Check points.

Scale Bars

Label	Distance (m)	Error (m)
target 5_target 6	0.147035	-0.000964805
target 8_target 7	0.147432	-0.000568192
target 9_target 10	0.149363	0.00136268
target 11_target 12	0.149273	0.00127345
target 13_target 14	0.148894	0.000893631
target 15_target 16	0.149384	0.00138415
target 8_target 15	0.153387	-0.000590954
point 1_point 2	0.602812	-0.000187682
point 3_point 4	0.610651	0.00765137
Total		**0.00271569**

Table 6. Check scale bars.

Digital Elevation Model

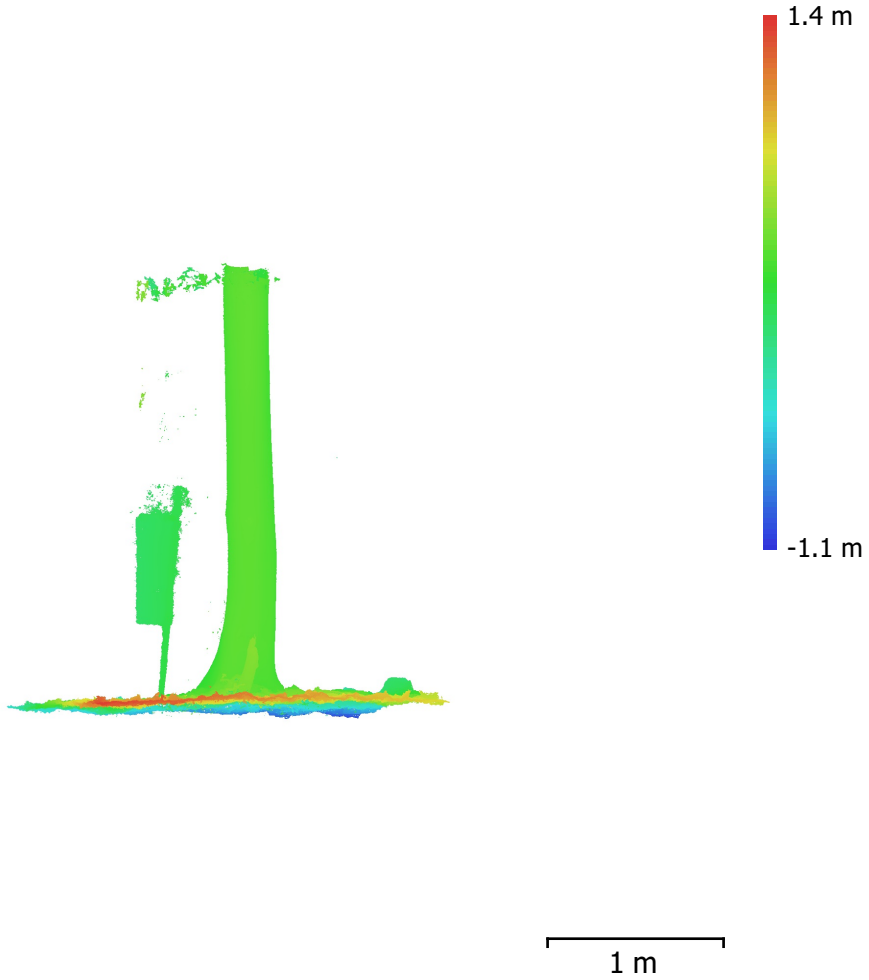

Fig. 4. Reconstructed digital elevation model.

Resolution:	unknown
Point density:	unknown

Processing Parameters

General	
Cameras	108
Aligned cameras	108
Markers	31
Scale bars	9
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	146,338 of 171,835
RMS reprojection error	0.131677 (0.705664 pix)
Max reprojection error	0.400977 (35.7282 pix)
Mean key point size	5.19818 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.76542
Alignment parameters	
Accuracy	High
Generic preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	39 minutes 57 seconds
Alignment time	1 minutes 48 seconds
Depth Maps	
Count	108
Reconstruction parameters	
Quality	Medium
Filtering mode	Aggressive
Processing time	2 hours 49 minutes
Dense Point Cloud	
Points	4,907,443
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	Medium
Depth filtering	Aggressive
Depth maps generation time	2 hours 49 minutes
Dense cloud generation time	31 minutes 38 seconds
Software	
Version	1.4.4 build 6848
Platform	Windows 64