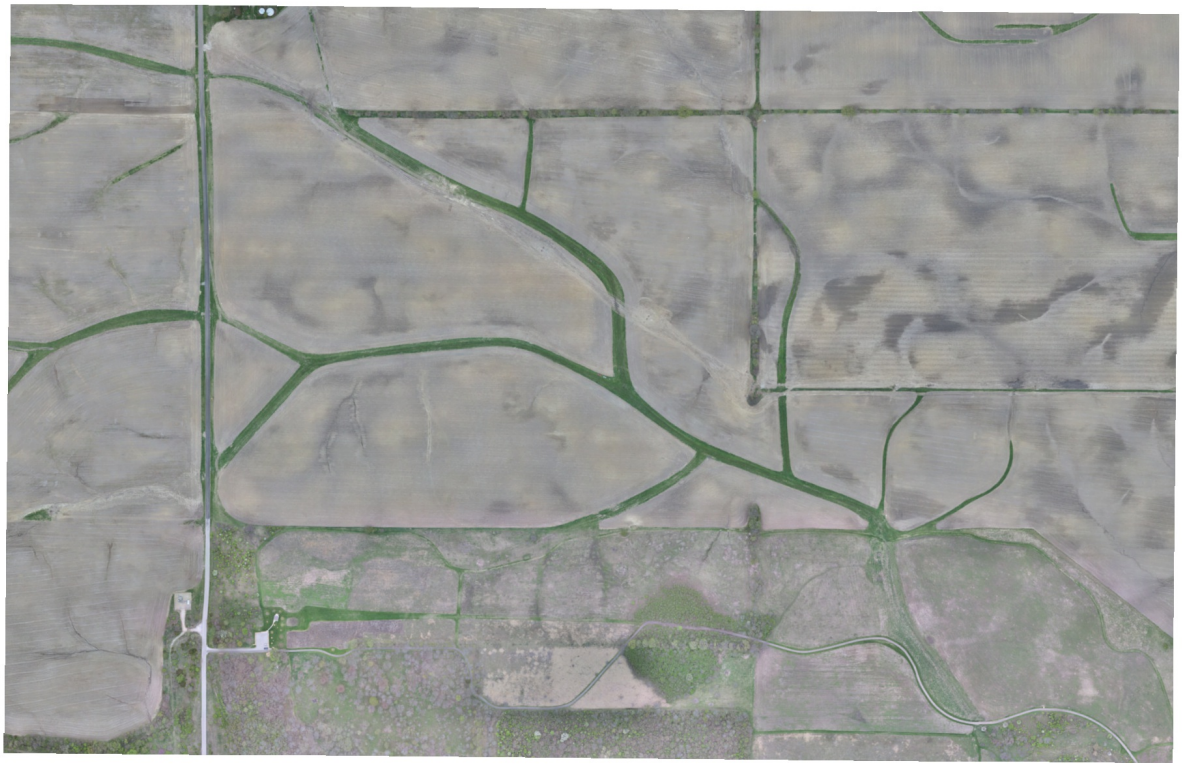
SAVANT_report

Processing Report

13 May 2019



Survey Data

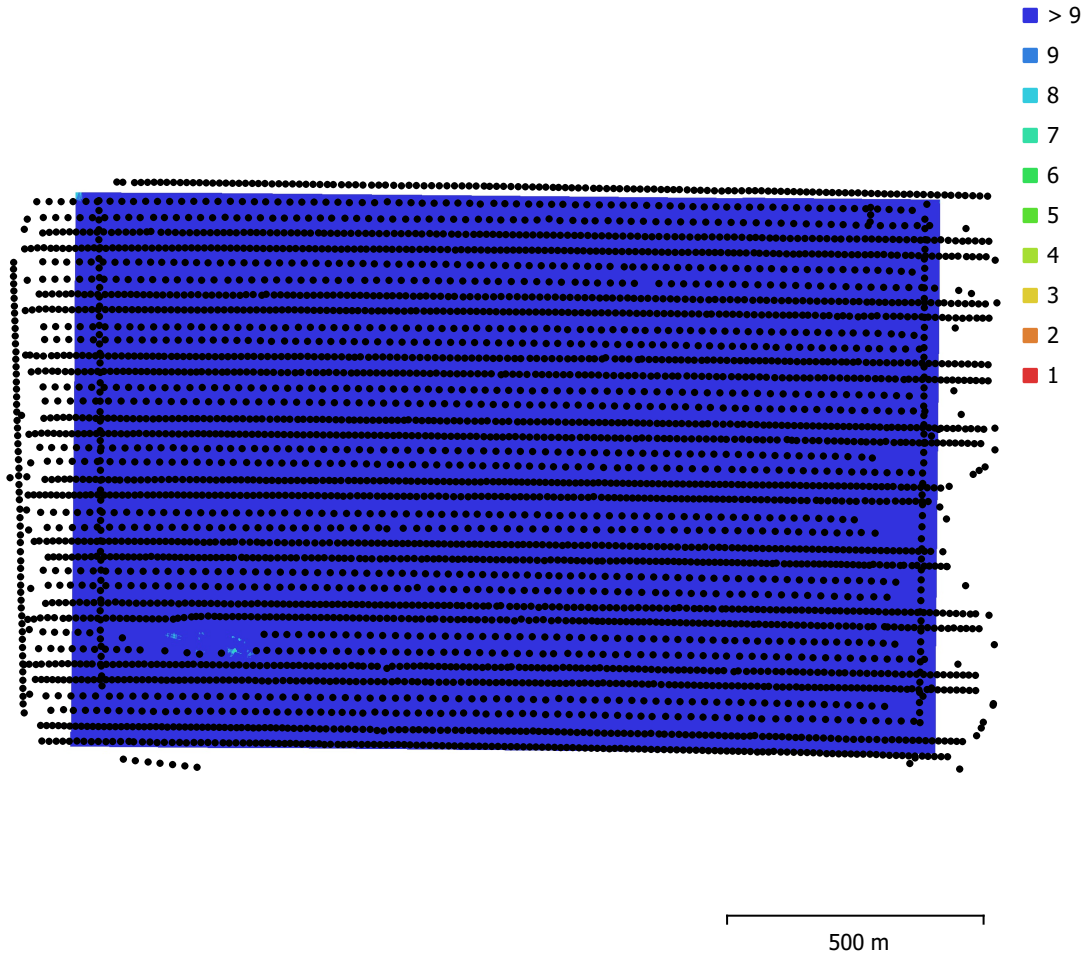


Fig. 1. Camera locations and image overlap.

Number of images:	4,215	Camera stations:	4,215
Flying altitude:	121 m	Tie points:	2,077,858
Ground resolution:	2.67 cm/pix	Projections:	10,971,297
Coverage area:	1.82 km²	Reprojection error:	2.32 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
Duo Pro R	4000 x 3000	unknown	unknown	No

Table 1. Cameras.

Camera Calibration

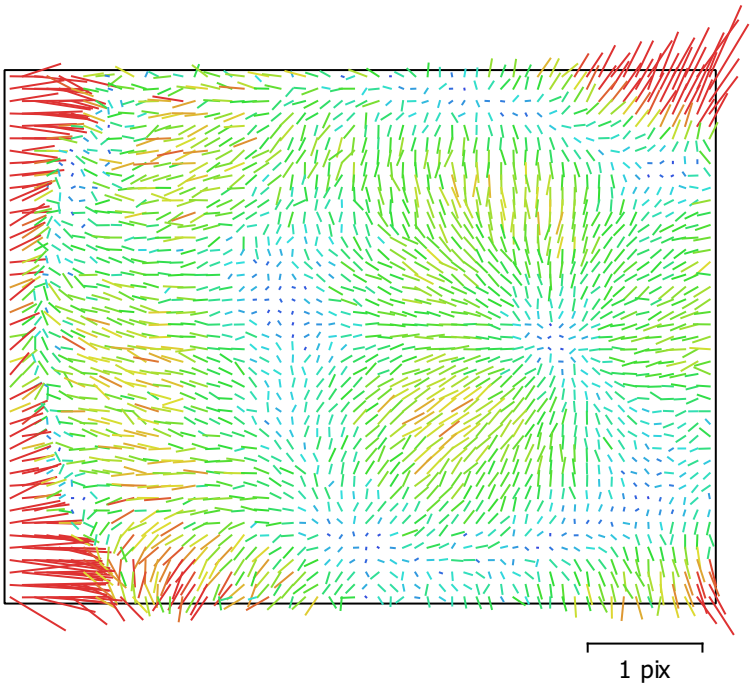


Fig. 2. Image residuals for Duo Pro R.

Duo Pro R

4215 images

Type	Resolution	Focal Length	Pixel Size
Frame	**4000 x 3000**	**unknown**	**unknown**

F:	4294.25		
Cx:	29.1549	B1:	-19.1351
Cy:	28.1447	B2:	-5.28657
K1:	-0.468003	P1:	0.0020426
K2:	0.367105	P2:	-0.00074172
K3:	-0.363499	P3:	0
K4:	0.238684	P4:	0

Camera Locations

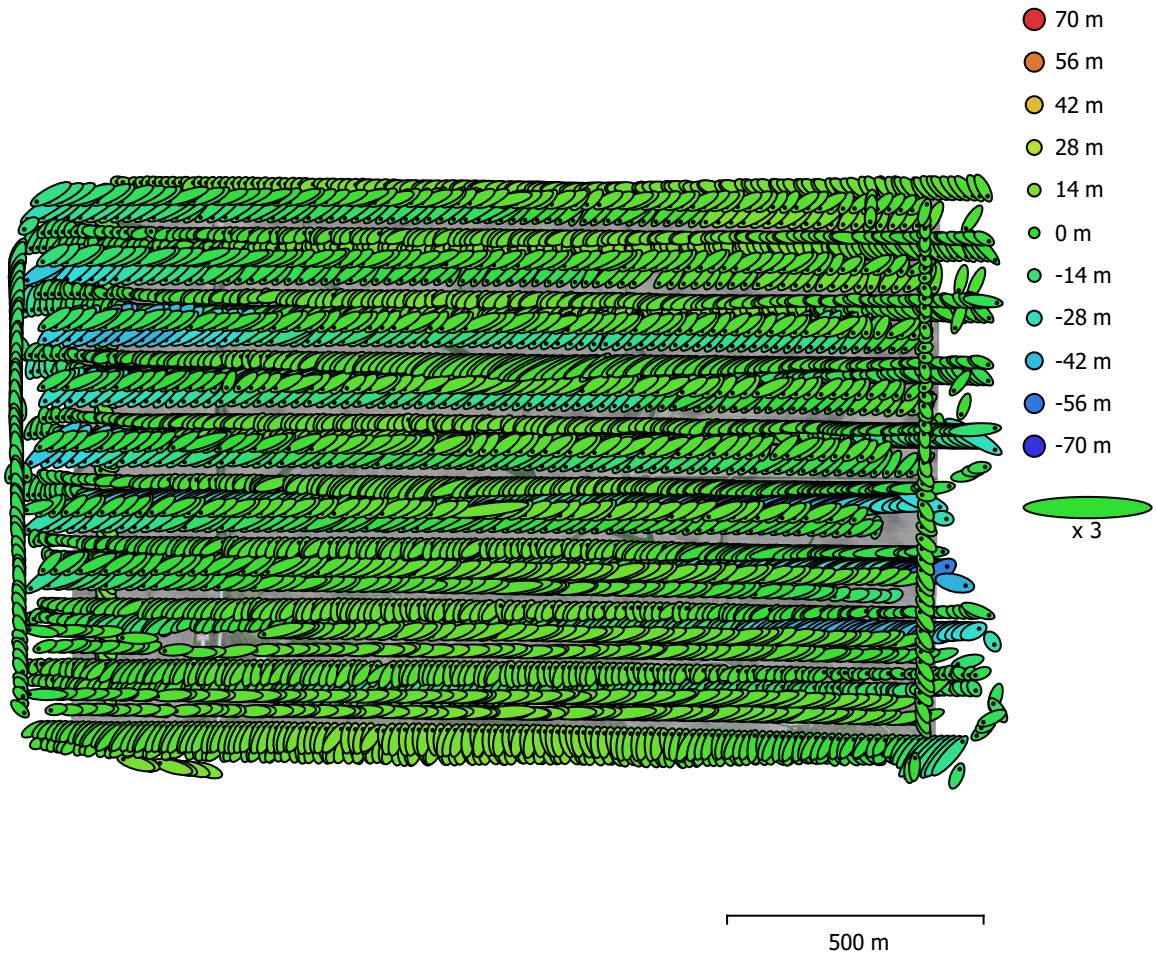


Fig. 3. Camera locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated camera locations are marked with a black dot.

X error (m)	Y error (m)	Z error (m)	XY error (m)	Total error (m)
11.5649	7.56896	13.263	13.8216	19.1558

Table 2. Average camera location error.
X - Longitude, Y - Latitude, Z - Altitude.

Ground Control Points

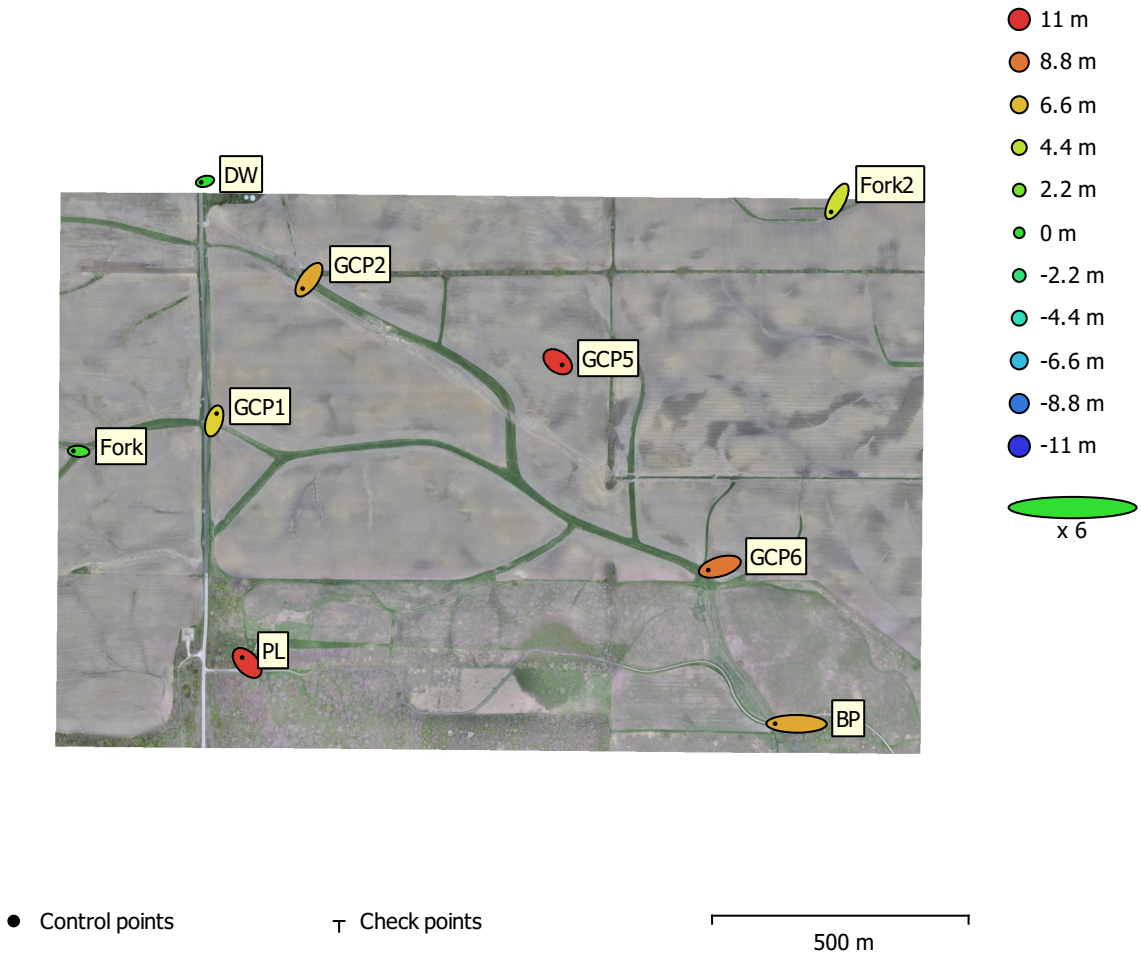


Fig. 4. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (m)	Y error (m)	Z error (m)	XY error (m)	Total (m)
9	5.95438	3.72636	7.25015	7.02428	10.0948

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

Label	X error (m)	Y error (m)	Z error (m)	Total (m)	Image (pix)
GCP6	-7.51545	-2.20609	8.80754	11.7865	1.755 (10)
GCP5	2.80876	-2.02728	10.7488	11.2932	4.032 (12)
GCP2	-4.12103	-5.71766	7.26965	10.1253	3.342 (7)
GCP1	1.55379	4.84171	5.96555	7.83864	2.220 (12)
DW	-2.49971	-0.615247	0.0685444	2.57522	1.833 (3)
PL	-3.23979	3.49527	10.7212	11.7327	6.495 (9)
Fork	-3.36972	0.258759	0.571299	3.42758	11.322 (9)
BP	-13.8912	0.110359	7.21186	15.6521	5.055 (10)
Fork2	-3.77612	-6.86927	4.9245	9.25725	4.100 (7)
Total	**5.95438**	**3.72636**	**7.25015**	**10.0948**	**5.372**

Table 4. Control points.

X - Longitude, Y - Latitude, Z - Altitude.

Digital Elevation Model

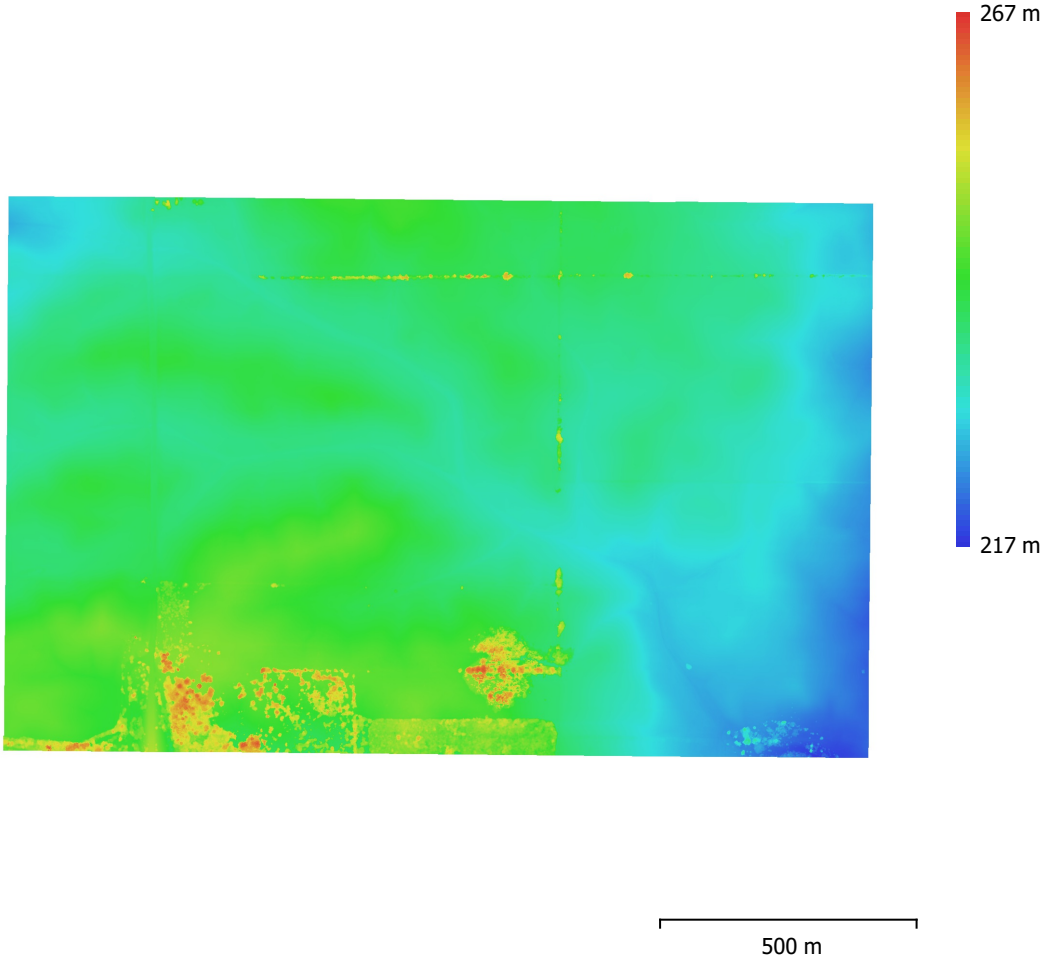


Fig. 5. Reconstructed digital elevation model.

Resolution:	10.7 cm/pix
Point density:	87.6 points/m²

Processing Parameters

General	
Cameras	4215
Aligned cameras	4215
Markers	9
Shapes	
Polylines	1731
Polygons	136243
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	2,077,858 of 2,579,293
RMS reprojection error	0.307673 (2.32465 pix)
Max reprojection error	0.948282 (71.3433 pix)
Mean key point size	8.53729 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	6.35017
Alignment parameters	
Accuracy	Medium
Generic preselection	Yes
Reference preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	36 minutes 45 seconds
Alignment time	21 hours 20 minutes
Software version	1.5.2.7838
Depth Maps	
Count	4214
Depth maps generation parameters	
Quality	Medium
Filtering mode	Mild
Processing time	1 days 5 hours
Software version	1.5.2.7838
Dense Point Cloud	
Points	242,942,763
Point colors	3 bands, uint8
Depth maps generation parameters	
Quality	Medium
Filtering mode	Mild
Processing time	1 days 5 hours
Dense cloud generation parameters	
Processing time	4 hours 32 minutes
Software version	1.5.2.7838
Model	
Faces	12,094,659
Vertices	6,049,355
Vertex colors	3 bands, uint8
Depth maps generation parameters	
Quality	Medium

General	
Filtering mode	Mild
Processing time	1 days 5 hours
Reconstruction parameters	
Surface type	Height field
Source data	Dense cloud
Interpolation	Enabled
Strict volumetric masks	No
Processing time	15 minutes 13 seconds
Software version	1.5.2.7838
DEM	
Size	15,870 x 10,264
Coordinate system	WGS 84 (EPSG::4326)
Reconstruction parameters	
Source data	Dense cloud
Interpolation	Enabled
Processing time	2 minutes 8 seconds
Software version	1.5.2.7838
Orthomosaic	
Size	16,952 x 10,955
Coordinate system	WGS 84 (EPSG::4326)
Colors	3 bands, uint8
Reconstruction parameters	
Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Processing time	6 minutes 56 seconds
Software version	1.5.2.7838
Software	
Version	1.5.2 build 7838
Platform	Windows 64