




Quality Report



Generated with Pix4Denterprise version 4.2.25

 **Important:** Click on the different icons for:

 Help to analyze the results in the Quality Report

 Additional information about the sections



Click [here](#) for additional tips to analyze the Quality Report











Summary



Project	Project 1
Processed	2018-04-26 22:12:24
Camera Model Name(s)	FC6310_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	0.76 cm / 0.30 in
Area Covered	0.037 km ² / 3.6939 ha / 0.01 sq. mi. / 9.1325 acres
Time for Initial Processing (without report)	38m:08s

Quality Check



 Images	median of 76968 keypoints per image	
 Dataset	249 out of 249 images calibrated (100%), all images enabled	
 Camera Optimization	2.66% relative difference between initial and optimized internal camera parameters	
 Matching	median of 15781 matches per calibrated image	
 Georeferencing	yes, no 3D GCP	

Preview



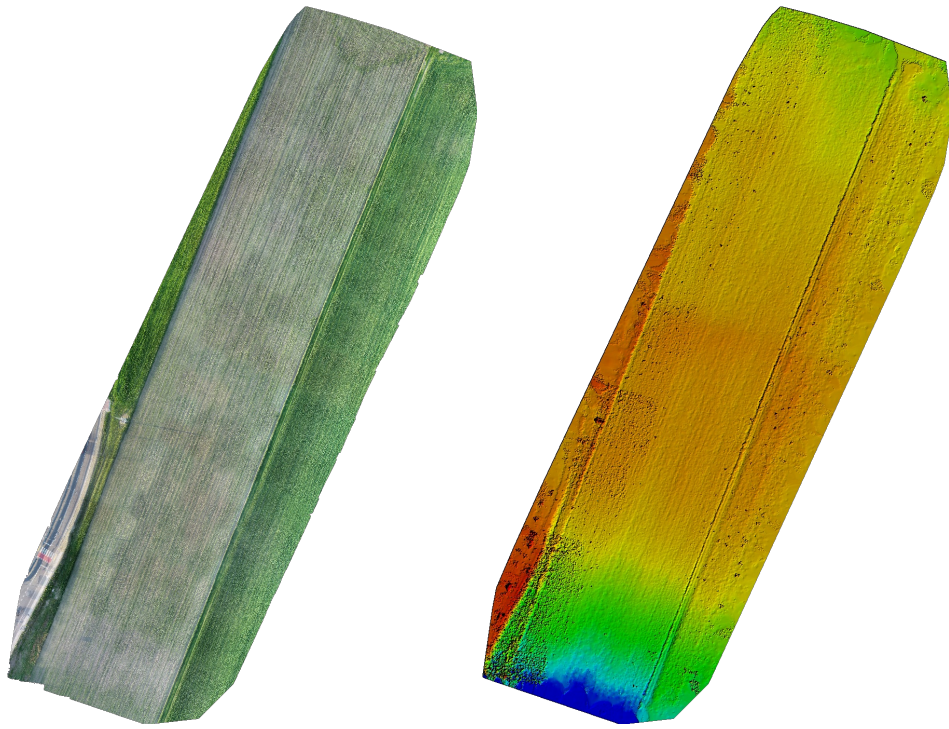


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

Calibration Details



Number of Calibrated Images	249 out of 249
Number of Geolocated Images	249 out of 249

Initial Image Positions



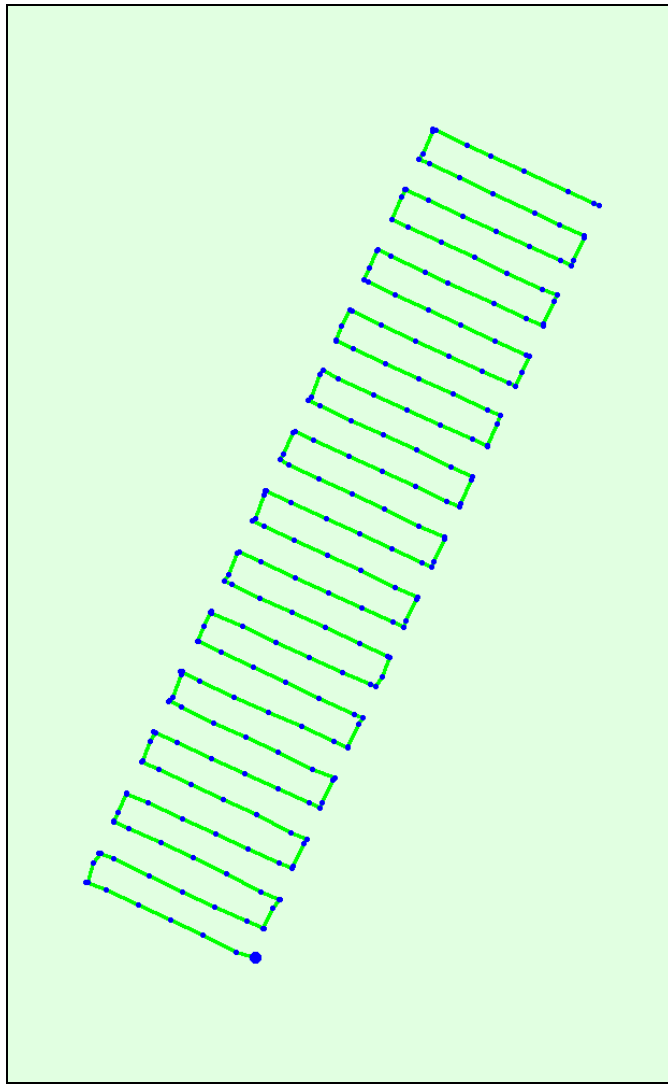
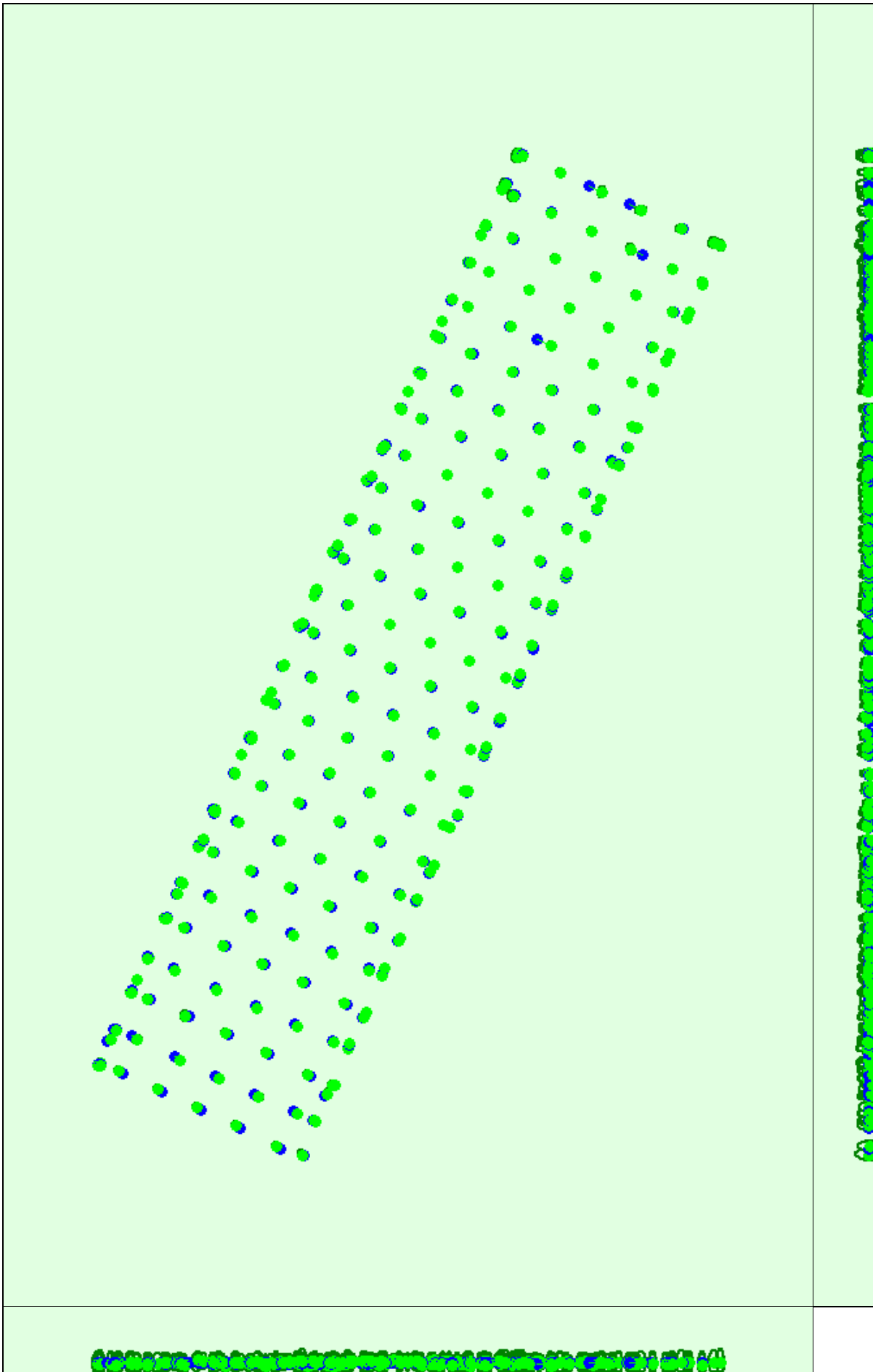


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

🔍 Computed Image/GCPs/Manual Tie Points Positions





Uncertainty ellipses 10x magnified

Figure 3: Offset between initial (blue dots) and computed (green dots) image positions as well as the offset between the GCPs initial positions (blue crosses) and their computed positions (green crosses) in the top-view (XY plane), front-view (XZ plane), and side-view (YZ plane). Dark green ellipses indicate the absolute position uncertainty of the bundle block adjustment result.

🔍 Absolute camera position and orientation uncertainties



	X [m]	Y [m]	Z [m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.107	0.107	0.266	0.146	0.310	0.046
Sigma	0.022	0.022	0.050	0.038	0.029	0.001

🔍 Overlap

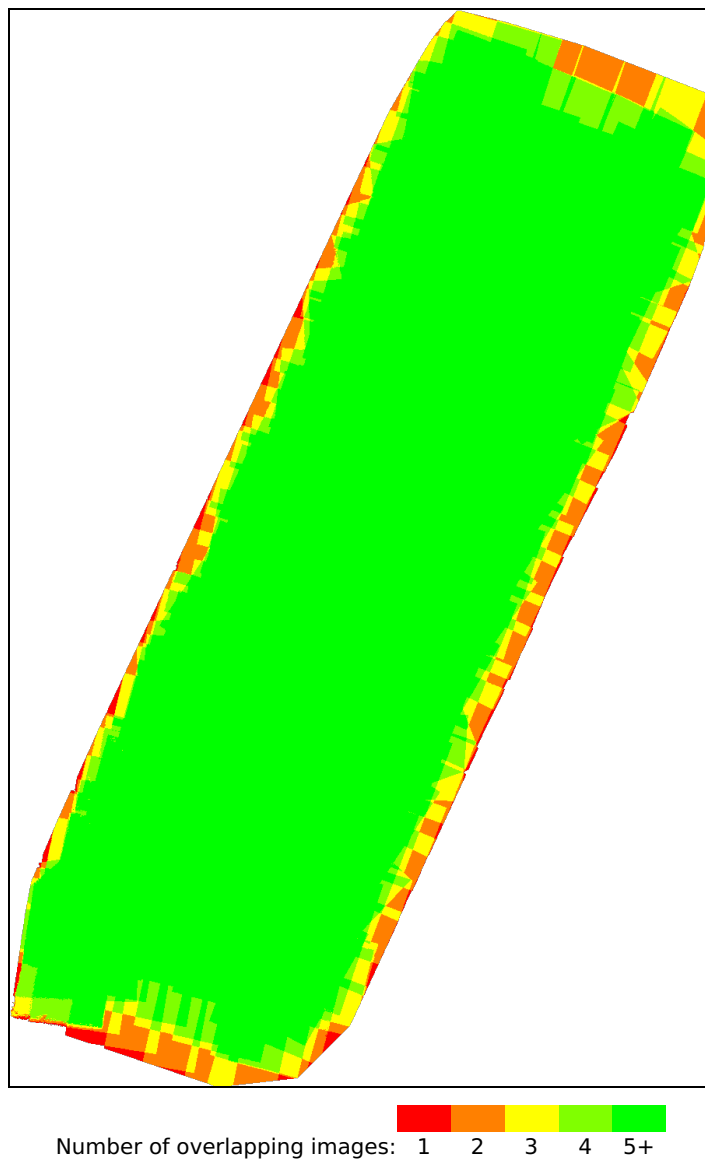


Figure 4: Number of overlapping images computed for each pixel of the orthomosaic.

Red and yellow areas indicate low overlap for which poor results may be generated. Green areas indicate an overlap of over 5 images for every pixel. Good quality results will be generated as long as the number of keypoint matches is also sufficient for these areas (see Figure 5 for keypoint matches).

Bundle Block Adjustment Details



Number of 2D Keypoint Observations for Bundle Block Adjustment	4676413
Number of 3D Points for Bundle Block Adjustment	1987648
Mean Reprojection Error [pixels]	0.151

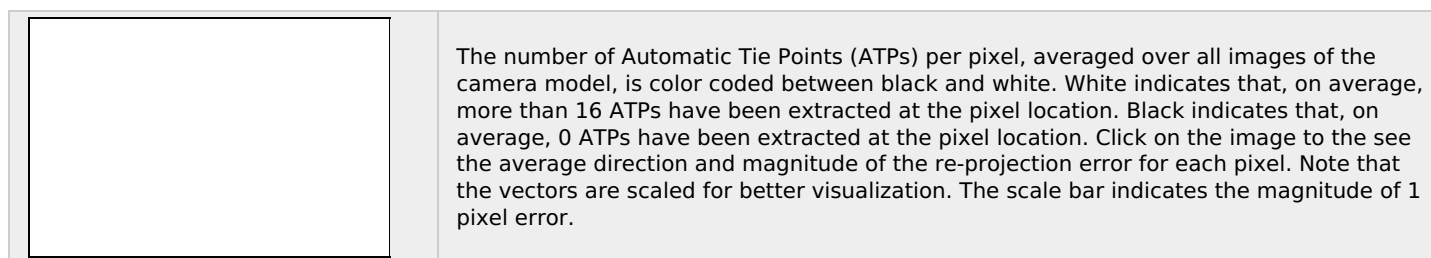
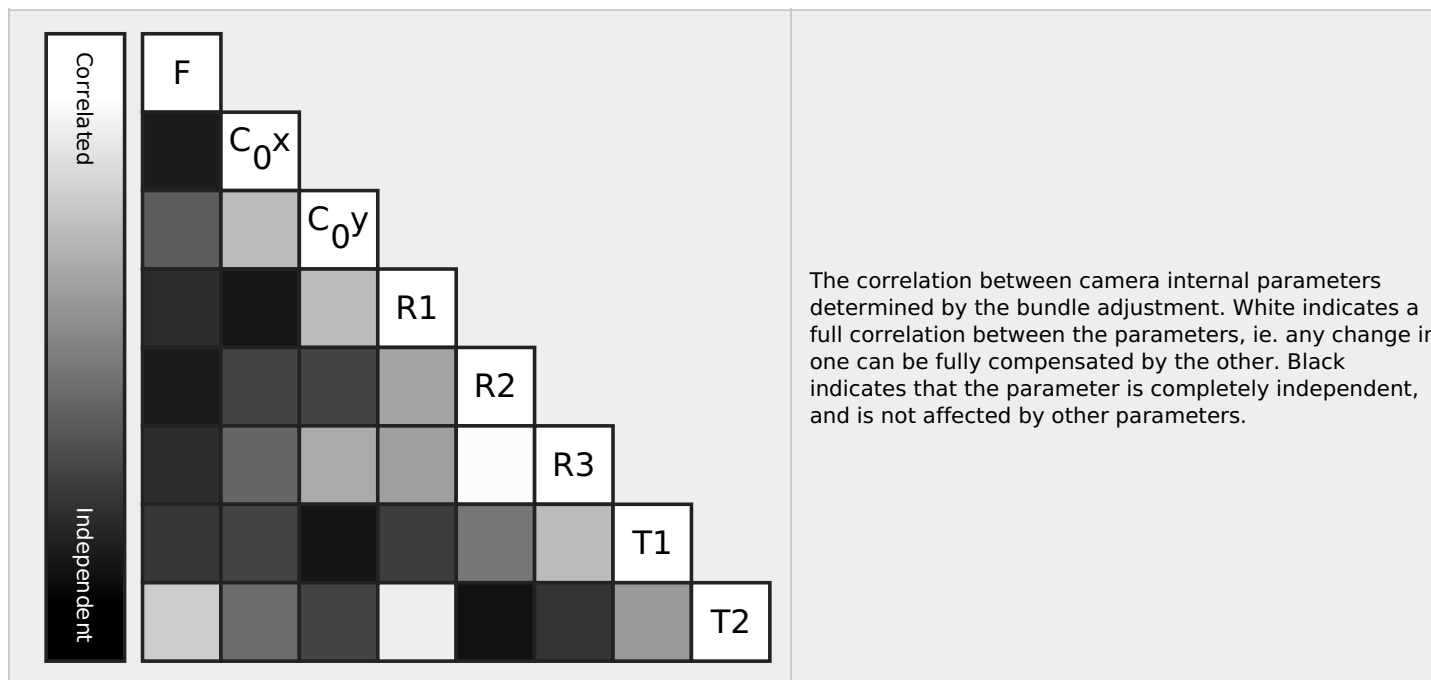
Internal Camera Parameters

FC6310_8.8_5472x3648 (RGB). Sensor Dimensions: 12.833 [mm] x 8.556 [mm]



EXIF ID: FC6310_8.8_5472x3648

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	3668.759 [pixel] 8.604 [mm]	2736.001 [pixel] 6.417 [mm]	1823.999 [pixel] 4.278 [mm]	0.003	-0.008	0.008	-0.000	0.000
Optimized Values	3766.654 [pixel] 8.834 [mm]	2728.873 [pixel] 6.400 [mm]	1835.692 [pixel] 4.305 [mm]	0.003	-0.006	0.006	0.001	-0.000
Uncertainties (Sigma)	7.977 [pixel] 0.019 [mm]	0.229 [pixel] 0.001 [mm]	0.284 [pixel] 0.001 [mm]	0.000	0.001	0.000	0.000	0.000



2D Keypoints Table



	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	76968	15781
Min	59600	1697
Max	88869	42789
Mean	76968	18781

3D Points from 2D Keypoint Matches

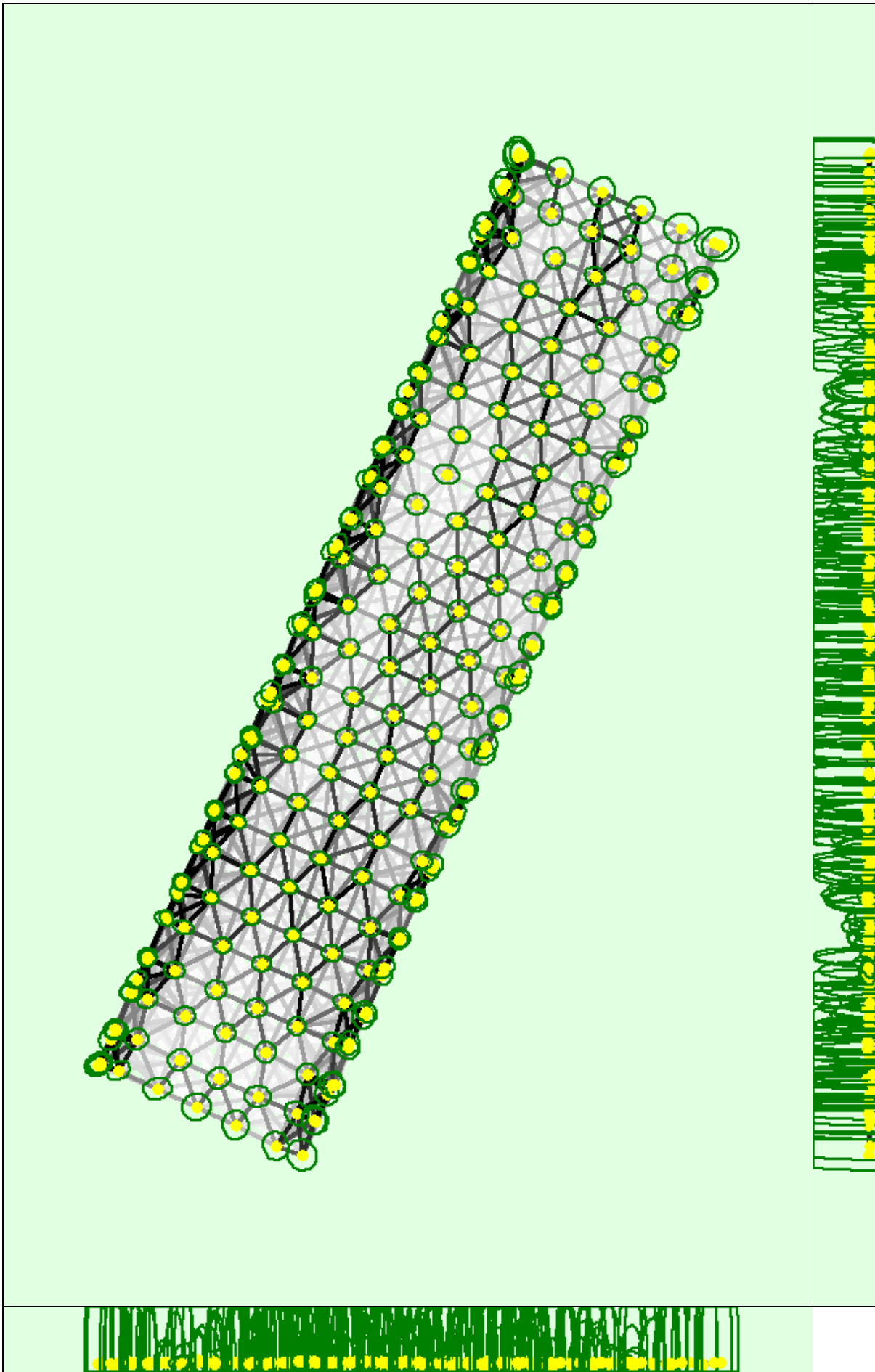


	Number of 3D Points Observed
In 2 Images	1587165
In 3 Images	255775
In 4 Images	74691

In 5 Images	31791
In 6 Images	16620
In 7 Images	9286
In 8 Images	5424
In 9 Images	3267
In 10 Images	1795
In 11 Images	1000
In 12 Images	488
In 13 Images	211
In 14 Images	73
In 15 Images	45
In 16 Images	15
In 17 Images	1
In 19 Images	1

2D Keypoint Matches





Uncertainty ellipses 500x magnified

Number of matches

25 222 444 666 888 1111 1333 1555 1777 2000

Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D

keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty of the bundle block adjustment result.

Relative camera position and orientation uncertainties



	X [m]	Y [m]	Z [m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.007	0.006	0.048	0.065	0.028	0.005
Sigma	0.001	0.001	0.027	0.036	0.016	0.001

Geolocation Details



Absolute Geolocation Variance



Min Error [m]	Max Error [m]	Geolocation Error X [%]	Geolocation Error Y [%]	Geolocation Error Z [%]
-	-15.00	0.00	0.00	0.00
-15.00	-12.00	0.00	0.00	0.00
-12.00	-9.00	0.00	0.00	0.00
-9.00	-6.00	0.00	0.00	0.00
-6.00	-3.00	1.20	0.00	0.00
-3.00	0.00	49.40	53.82	53.82
0.00	3.00	49.00	46.18	46.18
3.00	6.00	0.40	0.00	0.00
6.00	9.00	0.00	0.00	0.00
9.00	12.00	0.00	0.00	0.00
12.00	15.00	0.00	0.00	0.00
15.00	-	0.00	0.00	0.00
Mean [m]		-0.000010	0.000005	0.000001
Sigma [m]		0.659944	0.419039	0.408262
RMS Error [m]		0.659944	0.419039	0.408262

Min Error and Max Error represent geolocation error intervals between -1.5 and 1.5 times the maximum accuracy of all the images. Columns X, Y, Z show the percentage of images with geolocation errors within the predefined error intervals. The geolocation error is the difference between the initial and computed image positions. Note that the image geolocation errors do not correspond to the accuracy of the observed 3D points.

Relative Geolocation Variance



Relative Geolocation Error	Images X [%]	Images Y [%]	Images Z [%]
[-1.00, 1.00]	100.00	100.00	100.00
[-2.00, 2.00]	100.00	100.00	100.00
[-3.00, 3.00]	100.00	100.00	100.00
Mean of Geolocation Accuracy [m]	5.000000	5.000000	10.000000
Sigma of Geolocation Accuracy [m]	0.000000	0.000000	0.000000

Images X, Y, Z represent the percentage of images with a relative geolocation error in X, Y, Z.

Geolocation Orientational Variance	RMS [degree]
Omega	1.170
Phi	1.097
Kappa	7.314

Geolocation RMS error of the orientation angles given by the difference between the initial and computed image orientation angles.

Initial Processing Details



System Information



Hardware	CPU: Intel(R) Xeon(R) Platinum 8124M CPU @ 3.00GHz RAM: 69GB GPU: no info (Driver: unknown)
Operating System	Linux 3.13.0-144-generic x86_64

Coordinate Systems



Image Coordinate System	WGS84
Output Coordinate System	WGS 84 / UTM zone 33N

Processing Options



Detected Template	3D Maps
Keypoints Image Scale	Full, Image Scale: 1
Advanced: Matching Image Pairs	Aerial Grid or Corridor
Advanced: Matching Strategy	Use Geometrically Verified Matching: no
Advanced: Keypoint Extraction	Targeted Number of Keypoints: Automatic
Advanced: Calibration	Calibration Method: Standard Internal Parameters Optimization: All External Parameters Optimization: All Rematch: Auto, yes

Point Cloud Densification details



Processing Options



Image Scale	multiscale, 1/2 (Half image size, Default)
Point Density	Optimal
Minimum Number of Matches	3
3D Textured Mesh Generation	yes
3D Textured Mesh Settings:	Resolution: Medium Resolution (default) Color Balancing: no
LOD	Generated: no
Advanced: 3D Textured Mesh Settings	Sample Density Divider: 1
Advanced: Image Groups	group1
Advanced: Use Processing Area	yes
Advanced: Use Annotations	yes
Time for Point Cloud Densification	10m:47s
Time for Point Cloud Classification	NA

Time for 3D Textured Mesh Generation	09m:24s
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Results



Number of Generated Tiles	3
Number of 3D Densified Points	41803771
Average Density (per m ³)	6582.84

DSM, Orthomosaic and Index Details



Processing Options



DSM and Orthomosaic Resolution	1 x GSD (0.762 [cm/pixel])
DSM Filters	Noise Filtering: yes Surface Smoothing: yes, Type: Sharp
Raster DSM	Generated: yes Method: Inverse Distance Weighting Merge Tiles: yes
Orthomosaic	Generated: yes Merge Tiles: yes GeoTIFF Without Transparency: no Google Maps Tiles and KML: no
Time for DSM Generation	06m:40s
Time for Orthomosaic Generation	14m:31s
Time for DTM Generation	00s
Time for Contour Lines Generation	00s
Time for Reflectance Map Generation	00s
Time for Index Map Generation	00s