

Quality Report



Generated with Pix4Denterprise version 4.5.2 Preview



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	sss1
Processed	2020-02-14 00:08:54
Camera Model Name(s)	FC6310_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	1.27 cm / 0.50 in
Area Covered	0.012 km ² / 1.1855 ha / 0.00 sq. mi. / 2.9308 acres
Time for Initial Processing (without report)	06m:37s

Quality Check



Images	median of 53081 keypoints per image	
Dataset	29 out of 29 images calibrated (100%), all images enabled	
Camera Optimization	8.7% relative difference between initial and optimized internal camera parameters	
Matching	median of 10842.8 matches per calibrated image	
Georeferencing	yes, no 3D GCP	

Preview

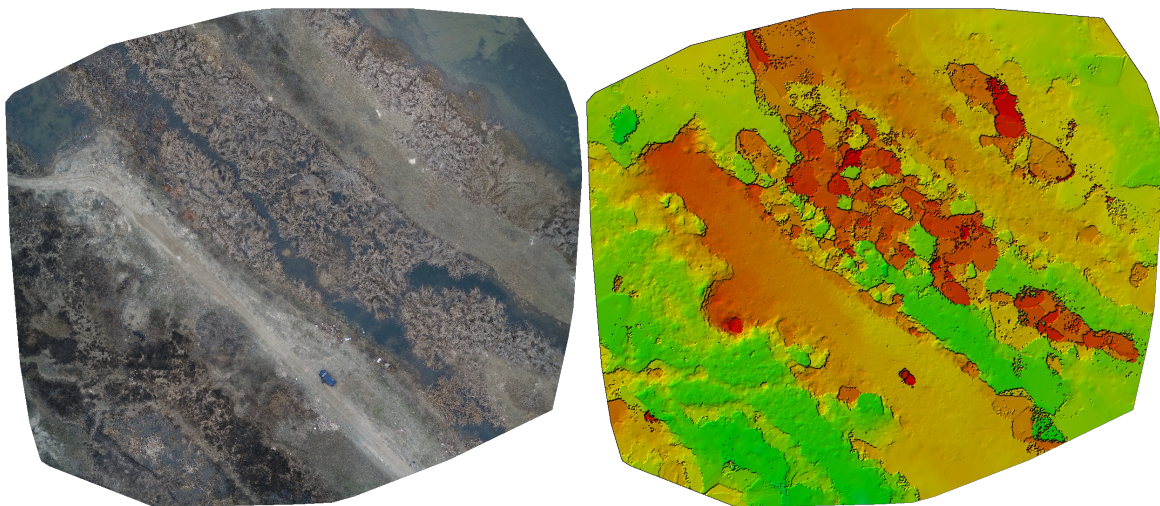


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

Calibration Details



Number of Calibrated Images	29 out of 29
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Initial Image Positions

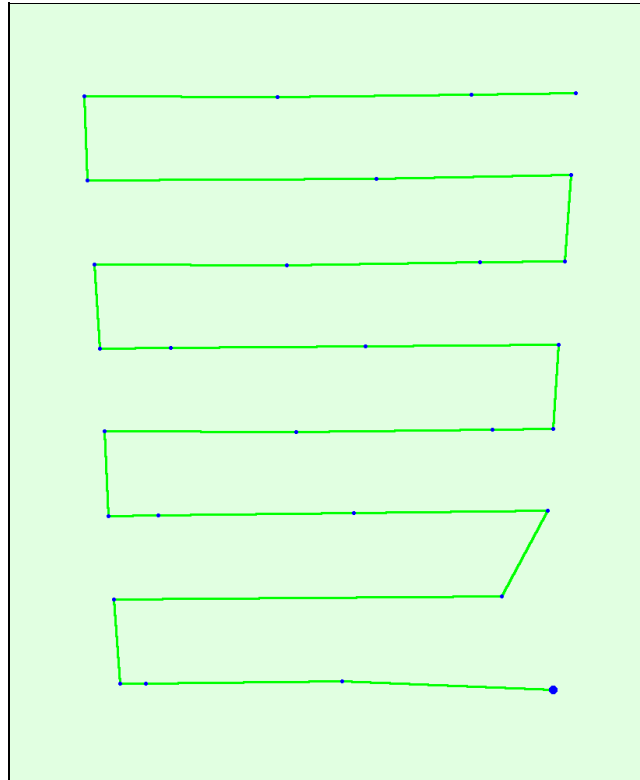


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

 Computed Image/GCPs/Manual Tie Points Positions



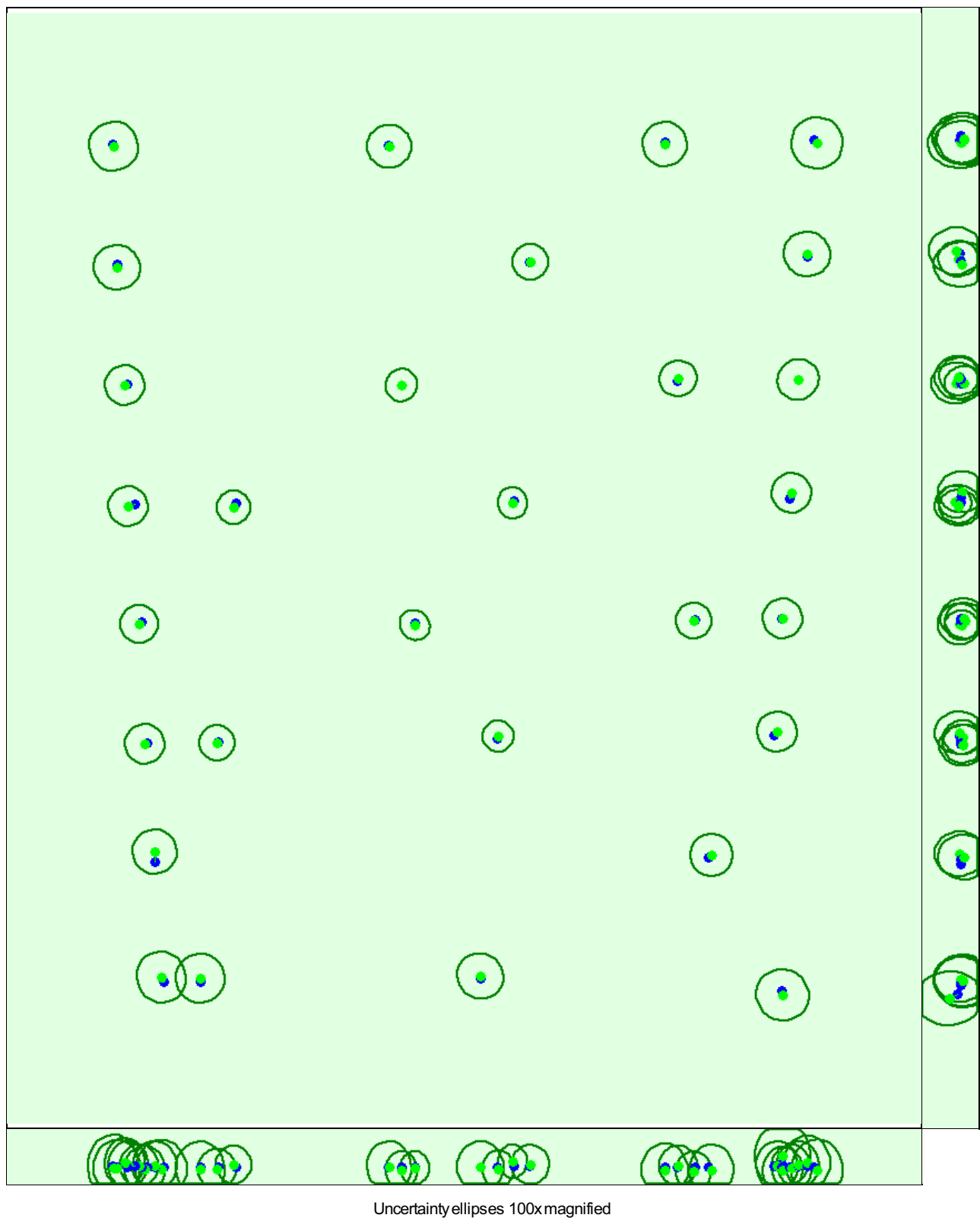


Figure 3: Offset between initial (blue dots) and computed (green dots) image positions as well as the offset between the GCPs initial positions (blue crosses) and their computed positions (green crosses) in the top-view (XY plane), front-view (XZ plane), and side-view (YZ plane). Dark green ellipses 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	0.017	0.017	0.020	0.034	0.034	0.023
Sigma	0.003	0.003	0.004	0.003	0.003	0.001

? Overlap



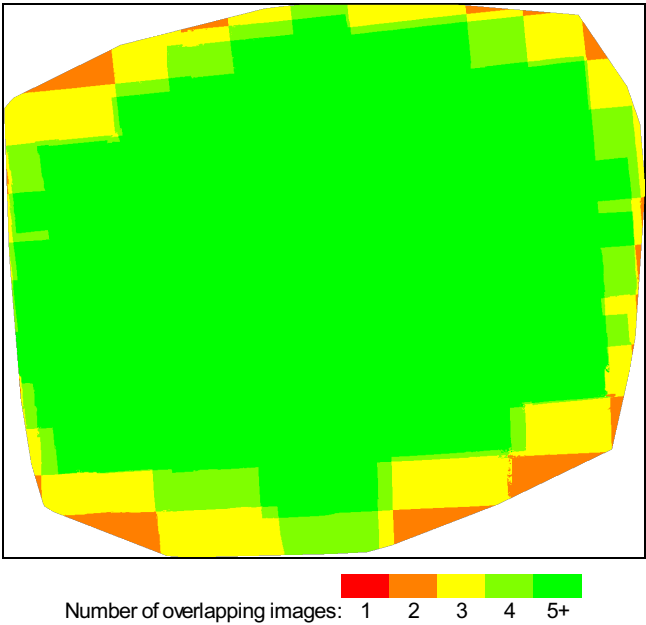


Figure 4: Number of overlapping images computed for each pixel of the orthomosaic. Red and yellow areas indicate low overlap for which poor results may be generated. Green areas indicate an overlap of over 5 images for every pixel. Good quality results will be generated as long as the number of keypoint matches is also sufficient for these areas (see Figure 5 for keypoint matches).

Bundle Block Adjustment Details

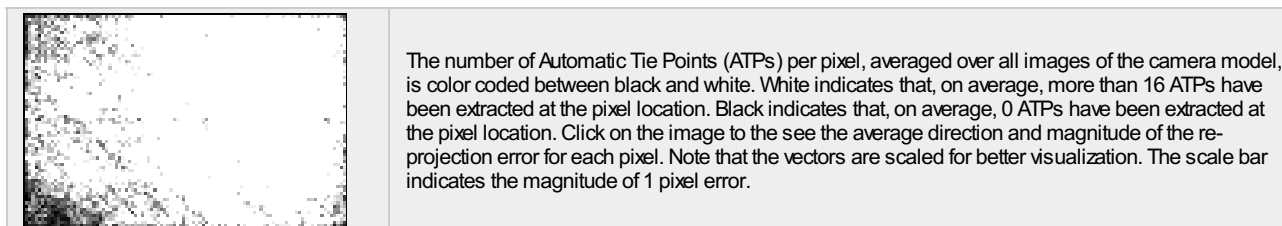
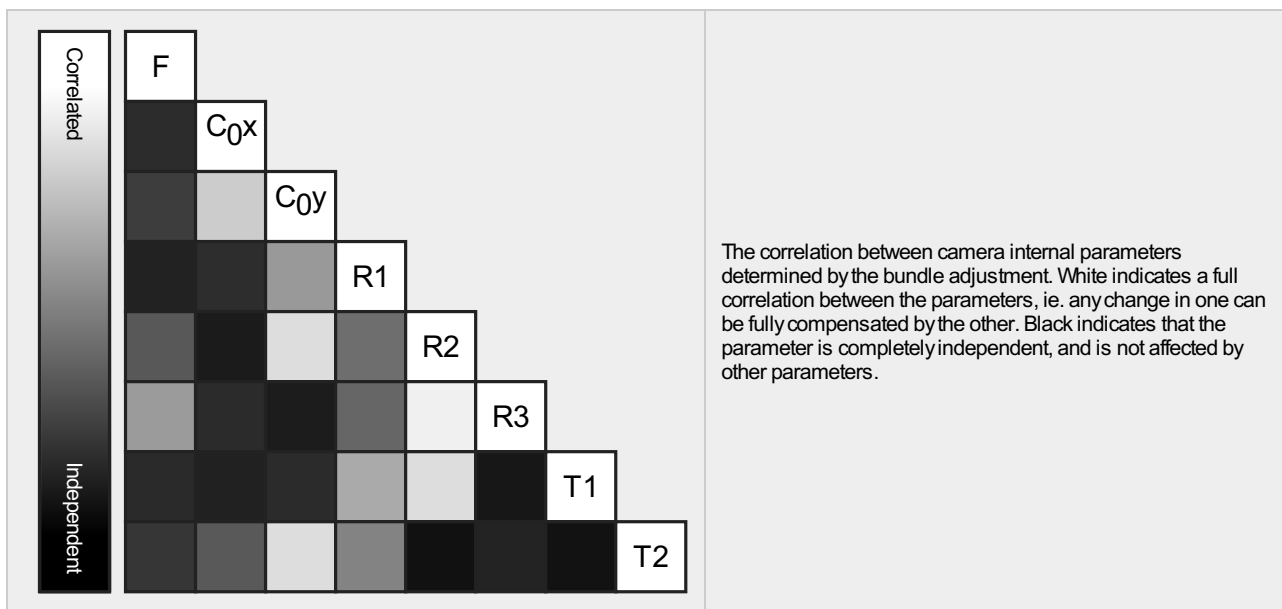
Number of 2D Keypoint Observations for Bundle Block Adjustment	354461
Number of 3D Points for Bundle Block Adjustment	130339
Mean Reprojection Error [pixels]	0.140

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	3349.237 [pixel] 7.855 [mm]	2711.384 [pixel] 6.359 [mm]	1846.138 [pixel] 4.330 [mm]	0.000	-0.003	0.003	0.001	0.001
Uncertainties (Sigma)	23.726 [pixel] 0.056 [mm]	4.538 [pixel] 0.011 [mm]	4.185 [pixel] 0.010 [mm]	0.000	0.000	0.000	0.000	0.000



2D Keypoints Table

	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	53081	10843
Min	48549	3362
Max	59499	23998
Mean	52990	12223

3D Points from 2D Keypoint Matches

	Number of 3D Points Observed
In 2 Images	89957
In 3 Images	20120
In 4 Images	8046
In 5 Images	4653
In 6 Images	2668
In 7 Images	1677
In 8 Images	1069
In 9 Images	783
In 10 Images	567
In 11 Images	326
In 12 Images	203
In 13 Images	145
In 14 Images	87
In 15 Images	19
In 16 Images	13
In 17 Images	4
In 18 Images	2

2D Keypoint Matches

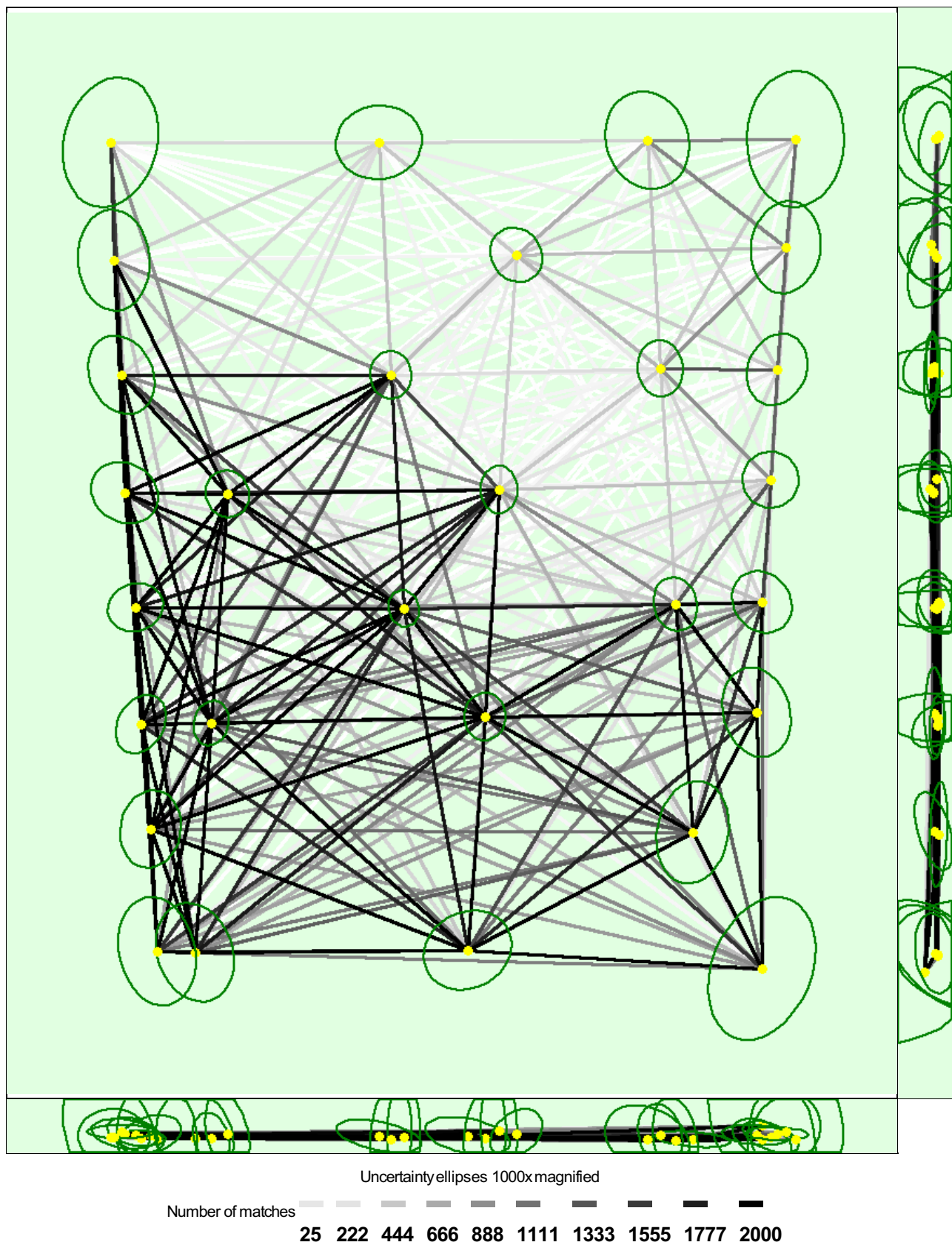


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty 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	0.003	0.003	0.003	0.017	0.019	0.008
Sigma	0.001	0.001	0.002	0.007	0.007	0.003

Geolocation Details



Absolute Geolocation Variance



Mn Error [m]	Max Error [m]	Geolocation Error X[%]	Geolocation Error Y[%]	Geolocation Error Z[%]
-	-0.75	0.00	0.00	0.00
-0.75	-0.60	0.00	3.45	3.45
-0.60	-0.45	0.00	0.00	0.00
-0.45	-0.30	6.90	10.34	6.90
-0.30	-0.15	6.90	13.79	6.90
-0.15	0.00	44.83	10.34	27.59
0.00	0.15	24.14	31.03	20.69
0.15	0.30	13.79	24.14	31.03
0.30	0.45	0.00	6.90	3.45
0.45	0.60	3.45	0.00	0.00
0.60	0.75	0.00	0.00	0.00
0.75	-	0.00	0.00	0.00
Mean [m]		0.000004	-0.000001	0.000001
Sigma [m]		0.171769	0.259858	0.221439
RMS Error [m]		0.171769	0.259858	0.221439

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]	96.55	96.55	96.55
[-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]	0.500000	0.500000	0.500000
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	1.016
Phi	0.235
Kappa	4.439

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) Core(TM) i5-3230M CPU @ 2.60GHz RAM: 4GB GPU: Intel(R) HD Graphics 4000 (Driver: 10.18.10.4425), RDPDD Chained DD (Driver: unknown), RDP Encoder Mirror Driver (Driver: unknown), RDP Reflector Display Driver (Driver: unknown)
Operating System	Windows 7 Ultimate, 64-bit

Coordinate Systems



Image Coordinate System	WGS 84 (EGM96 Geoid)
Output Coordinate System	WGS 84 / UTM zone 49N (EGM96 Geoid)

Processing Options



Detected Template	No Template Available
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	14m:19s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	16m:27s

Results



Number of Generated Tiles	1
Number of 3D Densified Points	5074132
Average Density (per m ³)	1319.22

DSM, Orthomosaic and Index Details



Processing Options



DSM and Orthomosaic Resolution	1 x GSD (1.27 [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
Grid DSM	Generated: yes, Spacing [cm]: 100

Contour Lines Generation	Generated: yes Contour Base [m]: 0 Elevation Interval [m]: 10 Resolution [cm]: 100 Minimum Line Size [vertices]: 20
Time for DSM Generation	09m:19s
Time for Orthomosaic Generation	53m:48s
Time for DTM Generation	00s
Time for Contour Lines Generation	12s
Time for Reflectance Map Generation	00s
Time for Index Map Generation	00s