

Quality Report



Generated with Pix4Dmapper Pro version 4.2.27



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	eldo_3k_2_x3
Processed	2018-08-16 08:55:14
Camera Model Name(s)	FC350_3.6_4000x3000 (RGB)
Average Ground Sampling Distance (GSD)	5.45 cm / 2.14 in
Area Covered	0.673 km ² / 67.2777 ha / 0.26 sq. mi. / 166.3329 acres
Time for Initial Processing (without report)	01h:42m:42s

Quality Check



Images	median of 11991 keypoints per image	
Dataset	1958 out of 1963 images calibrated (99%), all images enabled	
Camera Optimization	0.42% relative difference between initial and optimized internal camera parameters	
Matching	median of 1320.07 matches per calibrated image	
Georeferencing	yes, no 3D GCP	

Preview

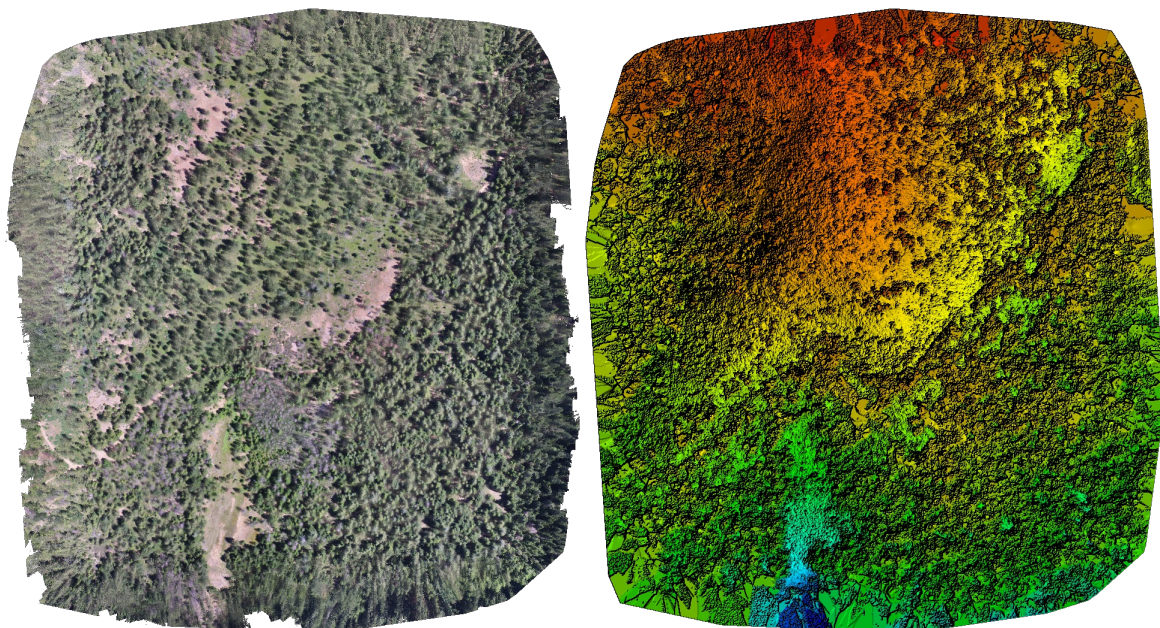


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

Calibration Details



Number of Calibrated Images	1958 out of 1963
Number of Geolocated Images	1963 out of 1963

Initial Image Positions

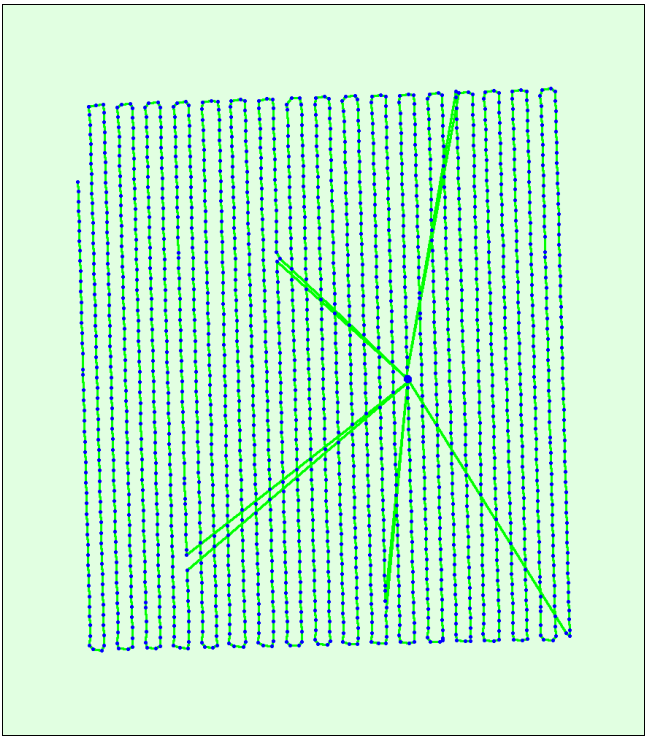
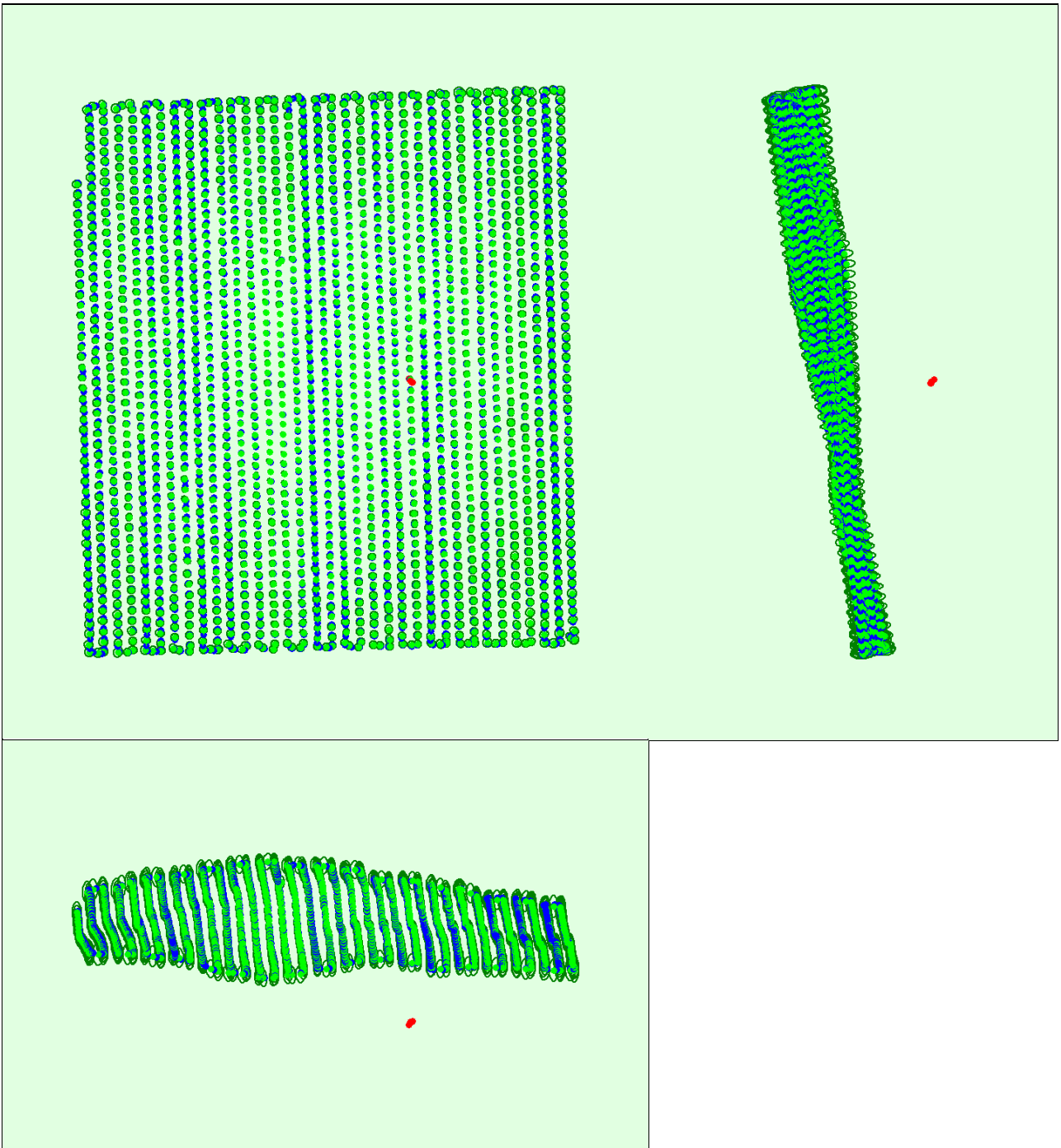


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

Computed Image/GCPs/Manual Tie Points Positions





Uncertainty ellipses 50x 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). Red dots indicate disabled or uncalibrated images. 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	0.080	0.082	0.175	0.034	0.037	0.014
Sigma	0.012	0.012	0.037	0.003	0.002	0.001

? Overlap



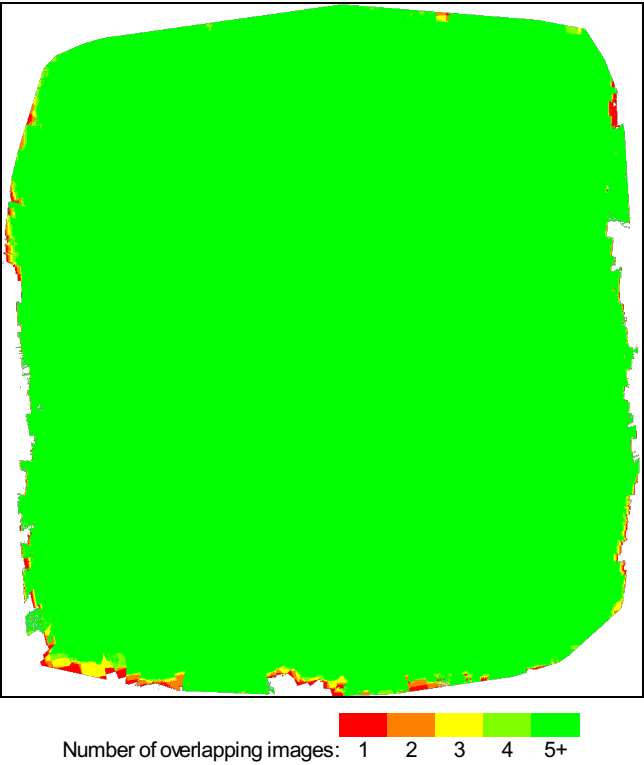


Figure 4: Number of overlapping images computed for each pixel of the orthomosaic. Red and yellow areas indicate low overlap for which poor results may be generated. Green areas indicate an overlap of over 5 images for every pixel. Good quality results will be generated as long as the number of keypoint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

Bundle Block Adjustment Details

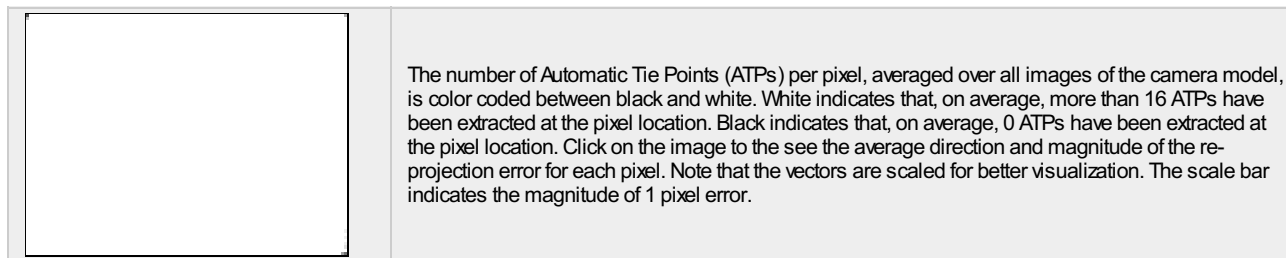
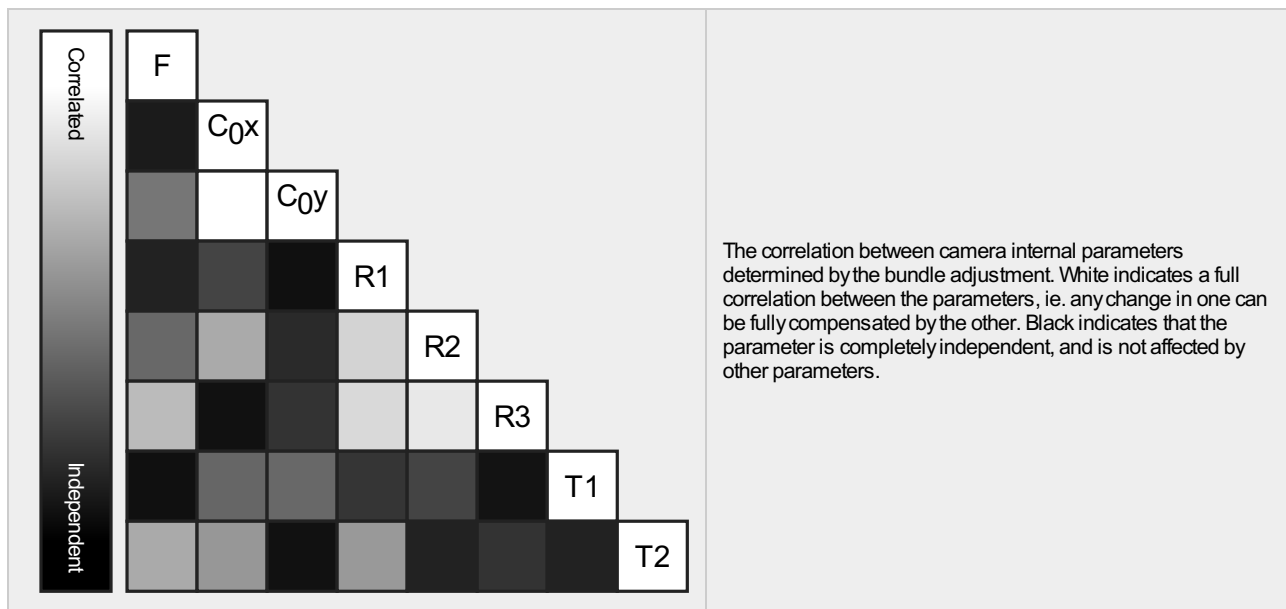
Number of 2D Keypoint Observations for Bundle Block Adjustment	2605859
Number of 3D Points for Bundle Block Adjustment	852719
Mean Reprojection Error [pixels]	0.136

Internal Camera Parameters

FC350_3.6_4000x3000 (RGB). Sensor Dimensions: 6.317 [mm] x 4.738 [mm]

EXIF ID: FC350_3.6_4000x3000

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	2285.722 [pixel] 3.610 [mm]	2000.006 [pixel] 3.159 [mm]	1500.003 [pixel] 2.369 [mm]	-0.130	0.106	-0.016	-0.000	0.000
Optimized Values	2295.514 [pixel] 3.625 [mm]	1985.487 [pixel] 3.136 [mm]	1503.585 [pixel] 2.375 [mm]	-0.126	0.107	-0.013	0.001	0.000
Uncertainties (Sigma)	0.405 [pixel] 0.001 [mm]	0.041 [pixel] 0.000 [mm]	0.042 [pixel] 0.000 [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	11991	1320
Min	10364	496
Max	13707	3325
Mean	11985	1331

? 3D Points from 2D Keypoint Matches



	Number of 3D Points Observed
In 2 Images	557489
In 3 Images	140114
In 4 Images	58458
In 5 Images	30221
In 6 Images	17987
In 7 Images	11727
In 8 Images	8146
In 9 Images	5722
In 10 Images	4207
In 11 Images	3195
In 12 Images	2559
In 13 Images	1986
In 14 Images	1541
In 15 Images	1277
In 16 Images	1082
In 17 Images	866
In 18 Images	708
In 19 Images	604
In 20 Images	514
In 21 Images	442
In 22 Images	402

In 23 Images	356
In 24 Images	337
In 25 Images	288
In 26 Images	244
In 27 Images	190
In 28 Images	184
In 29 Images	157
In 30 Images	138
In 31 Images	123
In 32 Images	105
In 33 Images	107
In 34 Images	88
In 35 Images	87
In 36 Images	80
In 37 Images	84
In 38 Images	70
In 39 Images	50
In 40 Images	54
In 41 Images	42
In 42 Images	41
In 43 Images	42
In 44 Images	44
In 45 Images	40
In 46 Images	33
In 47 Images	28
In 48 Images	24
In 49 Images	25
In 50 Images	28
In 51 Images	24
In 52 Images	27
In 53 Images	22
In 54 Images	21
In 55 Images	24
In 56 Images	11
In 57 Images	16
In 58 Images	15
In 59 Images	15
In 60 Images	7
In 61 Images	10
In 62 Images	10
In 63 Images	8
In 64 Images	8
In 65 Images	6
In 66 Images	11
In 67 Images	3
In 68 Images	6
In 69 Images	8
In 70 Images	7
In 71 Images	8
In 72 Images	11
In 73 Images	4
In 74 Images	6
In 75 Images	4
In 76 Images	6
In 77 Images	6
In 78 Images	5
In 79 Images	2
In 80 Images	3
In 81 Images	3

In 82 Images	3
In 83 Images	5
In 84 Images	2
In 85 Images	4
In 86 Images	2
In 87 Images	1
In 88 Images	1
In 89 Images	1
In 90 Images	3
In 91 Images	4
In 92 Images	3
In 93 Images	2
In 94 Images	2
In 95 Images	3
In 96 Images	1
In 97 Images	1
In 98 Images	3
In 99 Images	1
In 101 Images	1
In 102 Images	2
In 103 Images	2
In 105 Images	2
In 107 Images	2
In 108 Images	1
In 109 Images	1
In 113 Images	1
In 118 Images	2
In 119 Images	1
In 122 Images	1
In 123 Images	1
In 125 Images	2
In 129 Images	1
In 134 Images	2
In 161 Images	1
In 162 Images	1

 **2D Keypoint Matches**



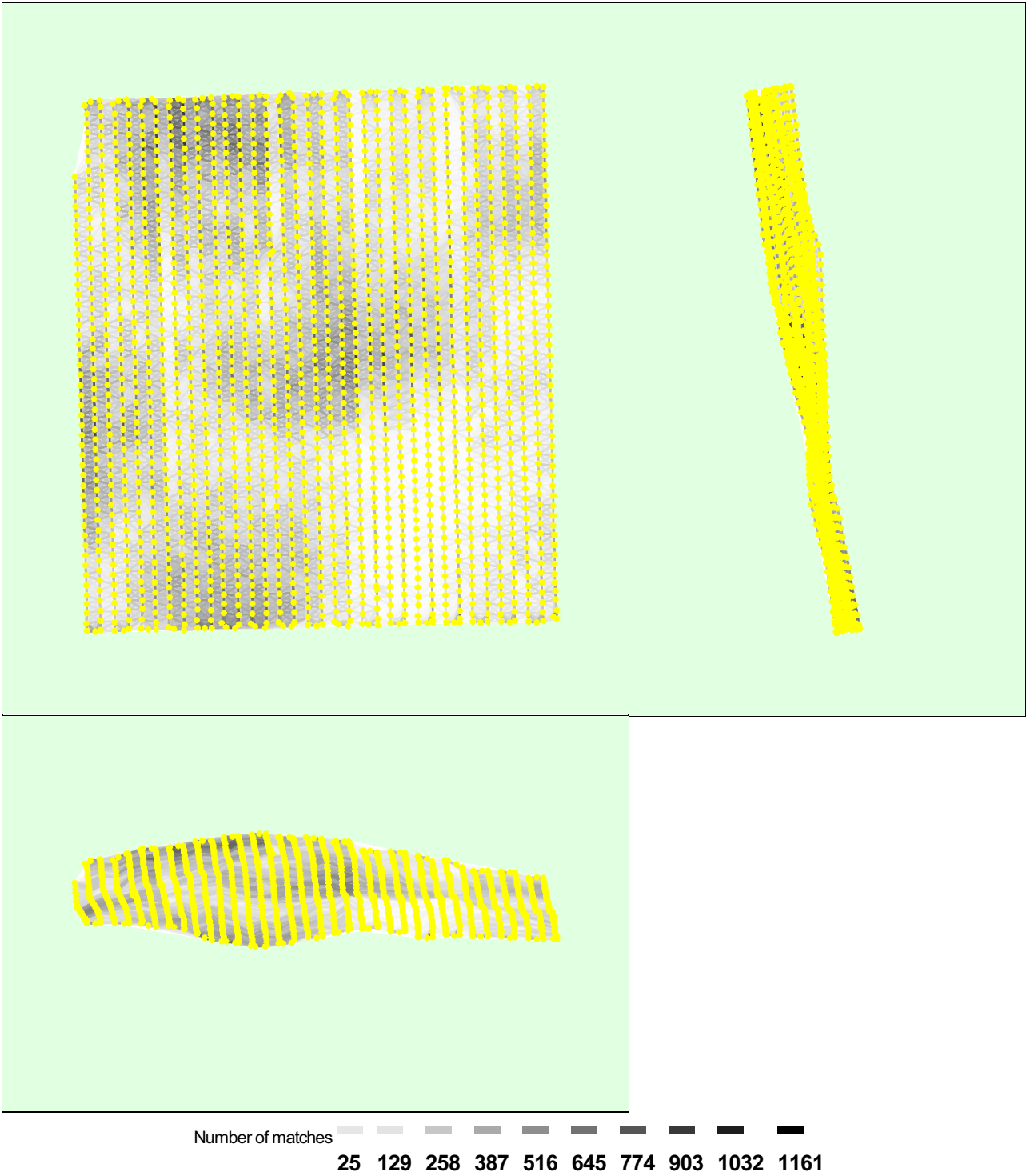


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images.

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	0.00	10.93	0.00

-3.00	0.00	50.66	42.03	50.72
0.00	3.00	48.57	32.94	48.77
3.00	6.00	0.77	13.99	0.51
6.00	9.00	0.00	0.10	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]		0.000000	0.000000	0.000000
Sigma [m]		0.796793	2.498888	1.014213
RMS Error [m]		0.796793	2.498888	1.014213

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]	99.95	97.80	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	0.831
Phi	0.807
Kappa	4.786

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) i7-8700K CPU @ 3.70GHz RAM: 64GB GPU: NVIDIA GeForce GTX 1080 Ti (Driver: 23.21.13.8795), Intel(R) UHD Graphics 630 (Driver: 22.20.16.4758)
Operating System	Windows 10 Education, 64-bit


Coordinate Systems



Image Coordinate System	WGS84 (egm96)
Output Coordinate System	WGS 84 / UTMzone 10N (egm96)

Processing Options



Detected Template	 RGB Local structure bark beetle severity*
Keypoints Image Scale	Custom, Image Scale: 0.5
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, no

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	07h:12m:06s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	39m:26s

Results



Number of Generated Tiles	4
Number of 3D Densified Points	82781141
Average Density (per m ³)	21.87

DSM, Orthomosaic and Index Details



Processing Options



DSM and Orthomosaic Resolution	1 x GSD (5.45 [cm/pixel])
DSM Filters	Noise Filtering: yes Surface Smoothing: yes, Type: Sharp
Raster DSM	Generated: yes Method: Triangulation Merge Tiles: yes
Orthomosaic	Generated: yes Merge Tiles: yes GeoTIFF Without Transparency: no Google Maps Tiles and KML: no
Time for DSM Generation	08m:36s
Time for Orthomosaic Generation	12h:07m:16s
Time for DTM Generation	00s
Time for Contour Lines Generation	00s
Time for Reflectance Map Generation	00s
Time for Index Map Generation	00s