

- !** **Important:** Click on the different icons for:
- ?** Help to analyze the results in the Quality Report
 - i** Additional information about the sections

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

Summary



Project	Flaam_uten_gcp
Processed	2021-04-13 15:36:24
Camera Model Name(s)	FC6310R_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	4.86 cm / 1.92 in
Time for Initial Processing (without report)	01h:02m:36s

Quality Check



? Images	median of 73141 keypoints per image	✓
? Dataset	545 out of 550 images calibrated (99%), all images enabled	✓
? Camera Optimization	0.95% relative difference between initial and optimized internal camera parameters	✓
? Matching	median of 13973.8 matches per calibrated image	✓
? Georeferencing	yes, no 3D GCP	⚠

Calibration Details



Number of Calibrated Images	545 out of 550
Number of Geolocated Images	550 out of 550

? Initial Image Positions



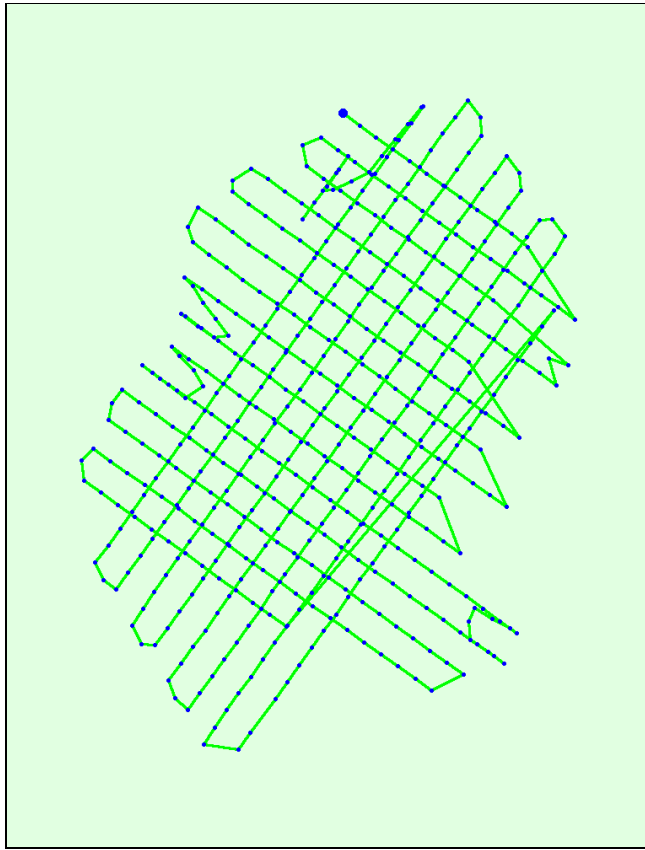
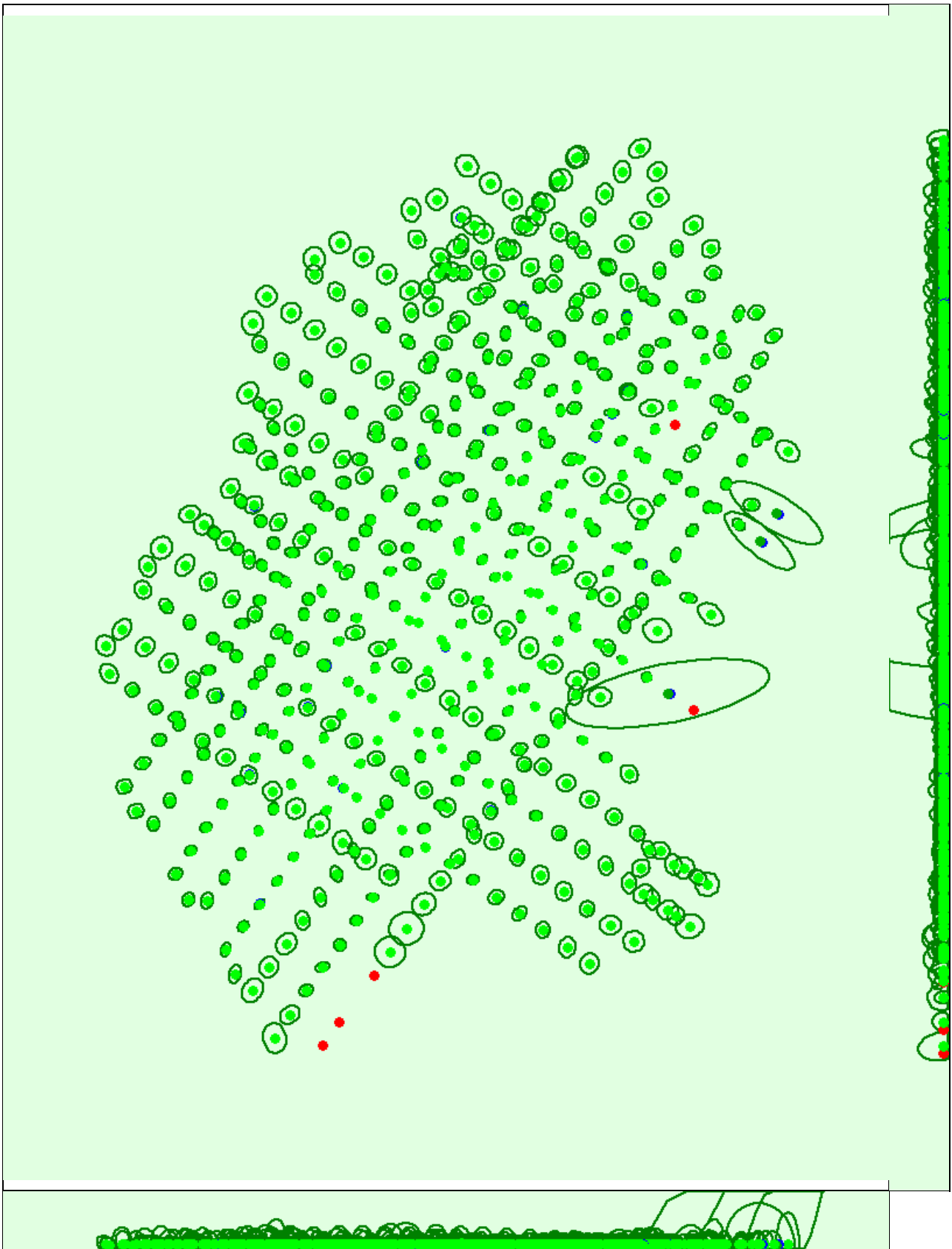


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

🔍 Computed Image/GCPs/Manual Tie Points Positions





Uncertainty ellipses 1000x 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	0.002	0.001	0.002	0.002	0.002	0.002
Sigma	0.001	0.001	0.002	0.002	0.002	0.001

Bundle Block Adjustment Details



Number of 2D Keypoint Observations for Bundle Block Adjustment	7598994
Number of 3D Points for Bundle Block Adjustment	2071360
Mean Reprojection Error [pixels]	0.100

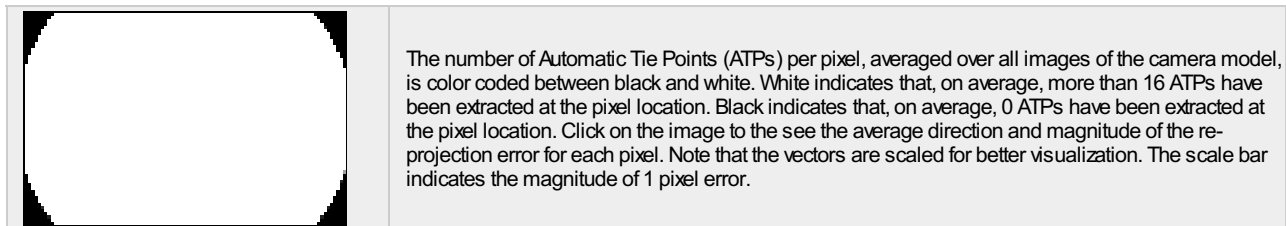
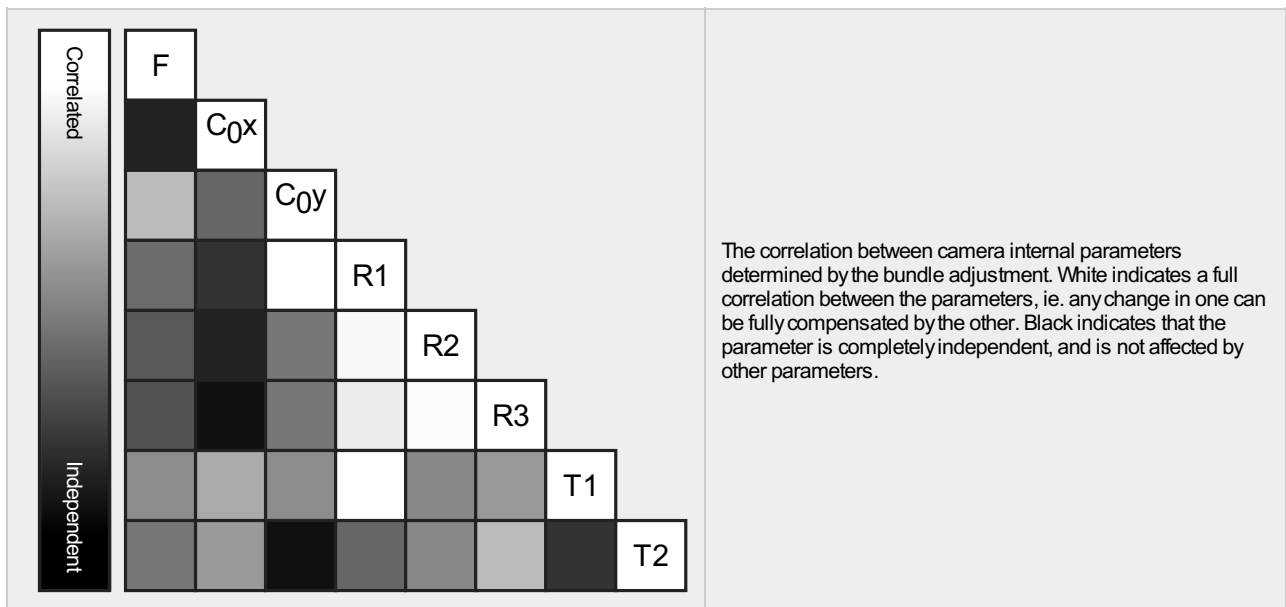
Internal Camera Parameters

FC6310R_8.8_5472x3648 (RGB). Sensor Dimensions: 12.833 [mm] x 8.556 [mm]



EXIF ID: FC6310R_8.8_5472x3648

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	3658.300 [pixel] 8.580 [mm]	2722.500 [pixel] 6.385 [mm]	1835.100 [pixel] 4.304 [mm]	-0.269	0.112	-0.033	0.000	-0.001
Optimized Values	3623.200 [pixel] 8.497 [mm]	2745.093 [pixel] 6.438 [mm]	1819.517 [pixel] 4.267 [mm]	-0.269	0.114	-0.034	0.000	-0.000
Uncertainties (Sigma)	0.040 [pixel] 0.000 [mm]	0.044 [pixel] 0.000 [mm]	0.051 [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	73141	13974
Mn	57408	93
Max	79951	32750
Mean	71830	13943

3D Points from 2D Keypoint Matches



	Number of 3D Points Observed
In 2 Images	1115426

In 3 Images	389994
In 4 Images	191888
In 5 Images	108279
In 6 Images	67715
In 7 Images	44590
In 8 Images	31257
In 9 Images	22817
In 10 Images	17315
In 11 Images	13324
In 12 Images	10477
In 13 Images	8349
In 14 Images	6899
In 15 Images	5665
In 16 Images	4626
In 17 Images	4032
In 18 Images	3302
In 19 Images	2839
In 20 Images	2435
In 21 Images	2076
In 22 Images	1829
In 23 Images	1552
In 24 Images	1341
In 25 Images	1224
In 26 Images	1061
In 27 Images	956
In 28 Images	836
In 29 Images	758
In 30 Images	690
In 31 Images	643
In 32 Images	537
In 33 Images	464
In 34 Images	415
In 35 Images	386
In 36 Images	332
In 37 Images	344
In 38 Images	290
In 39 Images	288
In 40 Images	248
In 41 Images	214
In 42 Images	224
In 43 Images	196
In 44 Images	170
In 45 Images	159
In 46 Images	157
In 47 Images	140
In 48 Images	148
In 49 Images	135
In 50 Images	118
In 51 Images	100
In 52 Images	115
In 53 Images	93
In 54 Images	86
In 55 Images	80
In 56 Images	88
In 57 Images	75
In 58 Images	60
In 59 Images	65
In 60 Images	59
In 61 Images	58

In 62 Images	52
In 63 Images	47
In 64 Images	43
In 65 Images	53
In 66 Images	42
In 67 Images	35
In 68 Images	49
In 69 Images	33
In 70 Images	45
In 71 Images	36
In 72 Images	21
In 73 Images	26
In 74 Images	29
In 75 Images	30
In 76 Images	30
In 77 Images	29
In 78 Images	23
In 79 Images	30
In 80 Images	31
In 81 Images	17
In 82 Images	22
In 83 Images	22
In 84 Images	23
In 85 Images	26
In 86 Images	23
In 87 Images	20
In 88 Images	15
In 89 Images	22
In 90 Images	22
In 91 Images	14
In 92 Images	17
In 93 Images	17
In 94 Images	14
In 95 Images	10
In 96 Images	11
In 97 Images	14
In 98 Images	7
In 99 Images	11
In 100 Images	14
In 101 Images	15
In 102 Images	11
In 103 Images	17
In 104 Images	16
In 105 Images	13
In 106 Images	6
In 107 Images	11
In 108 Images	13
In 109 Images	9
In 110 Images	9
In 111 Images	7
In 112 Images	4
In 113 Images	6
In 114 Images	8
In 115 Images	12
In 116 Images	9
In 117 Images	9
In 118 Images	2
In 119 Images	6
In 120 Images	5

In 121 Images	6
In 122 Images	6
In 123 Images	3
In 124 Images	5
In 125 Images	7
In 126 Images	6
In 127 Images	9
In 128 Images	5
In 129 Images	6
In 130 Images	4
In 131 Images	8
In 132 Images	4
In 133 Images	5
In 134 Images	3
In 137 Images	1
In 138 Images	2
In 139 Images	1
In 140 Images	4
In 141 Images	1
In 142 Images	1
In 144 Images	1
In 145 Images	1
In 146 Images	1
In 147 Images	1
In 149 Images	1
In 150 Images	2
In 151 Images	2
In 153 Images	1
In 159 Images	1
In 160 Images	1
In 163 Images	2
In 166 Images	2
In 170 Images	1
In 176 Images	2
In 196 Images	2

 2D Keypoint Matches



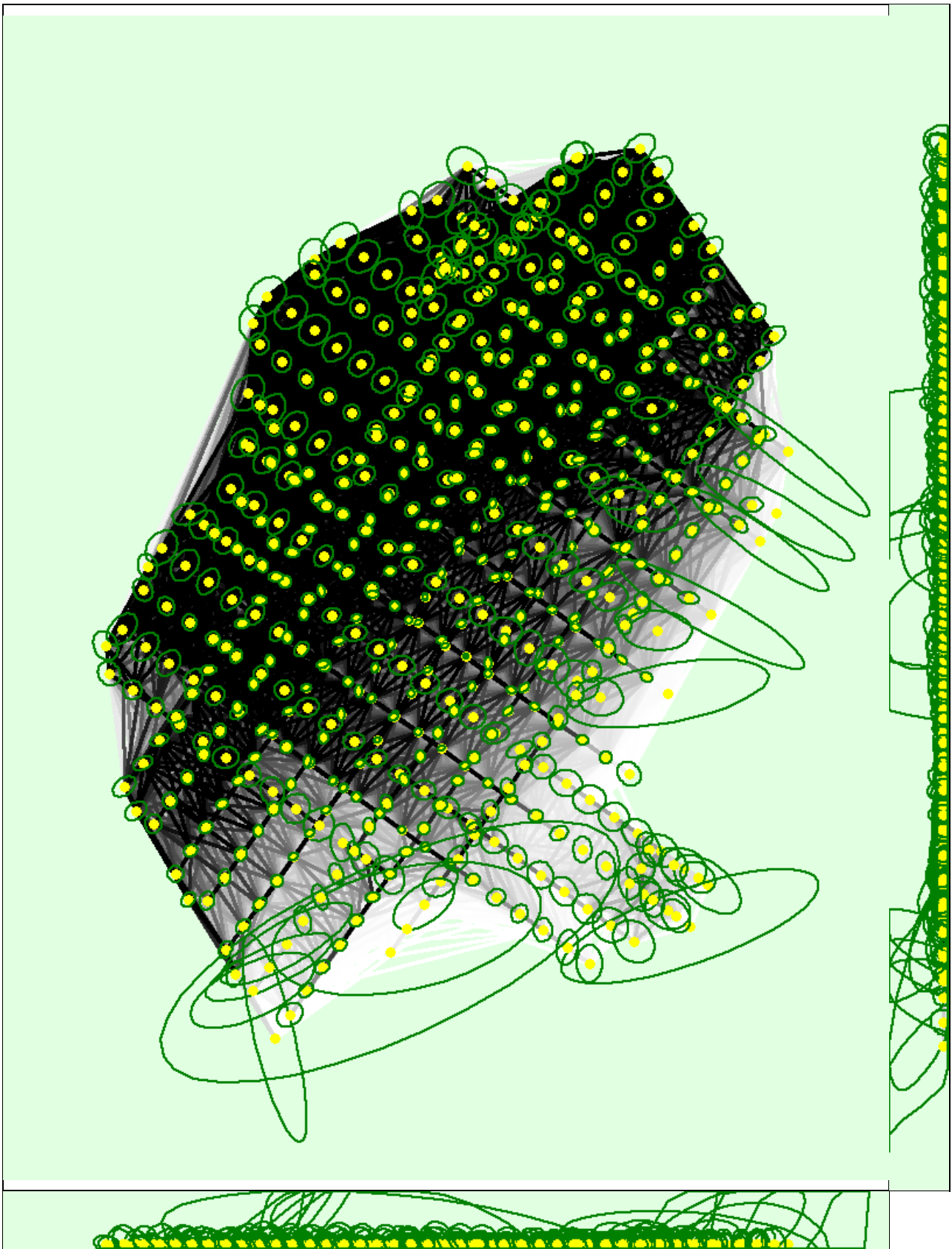


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty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

Geolocation Details



? Absolute Geolocation Variance



Min Error [m]	Max Error [m]	Geolocation Error X [%]	Geolocation Error Y [%]	Geolocation Error Z [%]
-	-0.04	0.00	0.00	0.00
-0.04	-0.03	0.00	0.00	0.00
-0.03	-0.03	0.00	0.00	0.74
-0.03	-0.02	0.37	0.18	3.69
-0.02	-0.01	7.75	5.54	10.33
-0.01	0.00	42.99	44.10	34.13
0.00	0.01	38.56	46.13	38.19
0.01	0.02	10.15	4.06	11.99
0.02	0.03	0.00	0.00	0.92
0.03	0.03	0.00	0.00	0.00
0.03	0.04	0.00	0.00	0.00
0.04	-	0.18	0.00	0.00
Mean [m]		0.000039	0.000028	-0.000407
Sigma [m]		0.006365	0.005396	0.008466
RMS Error [m]		0.006365	0.005396	0.008475

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]	95.02	98.89	99.26
[-2.00, 2.00]	99.82	100.00	100.00
[-3.00, 3.00]	99.82	100.00	100.00
Mean of Geolocation Accuracy [m]	0.012418	0.012418	0.025563
Sigma of Geolocation Accuracy [m]	0.000551	0.000551	0.001790

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

Geolocation Orientational Variance	RMS [degree]
Omega	1.464
Phi	1.463
Kappa	3.405

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) i7-8550U CPU @ 1.80GHz RAM: 16GB GPU: Intel(R) UHD Graphics 620 (Driver: 24.20.100.6286)
Operating System	Windows 10 Pro, 64-bit

Coordinate Systems

Image Coordinate System	WGS 84
Output Coordinate System	WGS 84 / UTMzone 32N (EGM2008 Geoid)

Processing Options

Detected Template	No Template Available
Keypoints Image Scale	Full, Image Scale: 1
Advanced: Matching Image Pairs	Free Flight or Terrestrial
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	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	03h:37m:07s
Time for Point Cloud Classification	06m:30s
Time for 3D Textured Mesh Generation	27m:35s

Results

Number of Processed Clusters	4
Number of Generated Tiles	1
Number of 3D Densified Points	24589616
Average Density (per m ³)	144.15

DSM, Orthomosaic and Index Details

Processing Options

DSM and Orthomosaic Resolution	1 x GSD (4.86 [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	52m:34s
Time for Orthomosaic Generation	01h:54m:54s
Time for DTM Generation	00s
Time for Contour Lines Generation	00s
Time for Reflectance Map Generation	00s
Time for Index Map Generation	00s