

Quality Report



Generated with Pix4Dmapper version 4.6.4



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	50%mgeom_mgcp_8
Processed	2021-05-11 16:47:40
Camera Model Name(s)	Insta360Pro_1.9_7680x3840 (RGB)
Average Ground Sampling Distance (GSD)	0.83 cm / 0.33 in
Time for Initial Processing (without report)	01h:40m:24s

Quality Check



Images	median of 24902 keypoints per image	
Dataset	537 out of 537 images calibrated (100%), all images enabled	
Camera Optimization	0% relative difference between initial and optimized internal camera parameters	
Matching	median of 5260.48 matches per calibrated image	
Georeferencing	yes, 30 GCPs (30 3D), mean RMS error = 0.08 m	

Calibration Details



Number of Calibrated Images	537 out of 537
Number of Geolocated Images	0 out of 537

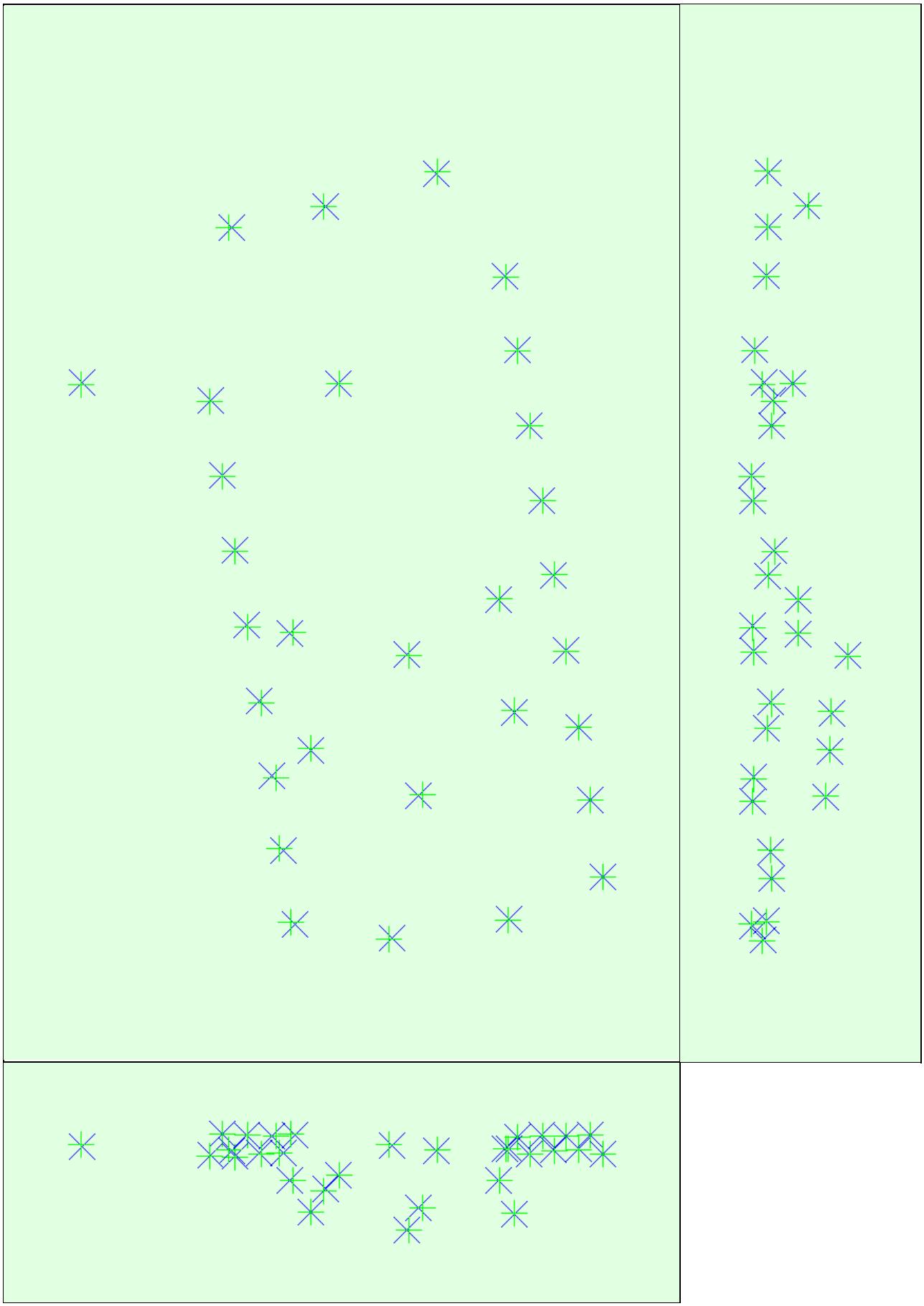
Initial Image Positions



The preview is not generated for images without geolocation.

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). Dark green ellipses indicate the absolute position uncertainty of the bundle block adjustment result.

⚠ Absolute camera position and orientation uncertainties

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	X[m]	Y[m]	Z[m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.004	0.004	0.004	0.112	0.016	0.046
Sigma	0.001	0.001	0.001	0.213	0.003	0.207

Bundle Block Adjustment Details

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Number of 2D Keypoint Observations for Bundle Block Adjustment	2772597
Number of 3D Points for Bundle Block Adjustment	1180872
Mean Reprojection Error [pixels]	0.467

⚠ Internal Camera Parameters



EXIF ID: Insta360Pro_1.9_7680x3840

It is a spherical camera and it doesn't have internal parameters.

	The number of Automatic Tie Points (ATPs) per pixel, averaged over all images of the camera model, is color coded between black and white. White indicates that, on average, more than 16 ATPs have been extracted at the pixel location. Black indicates that, on average, 0 ATPs have been extracted at the pixel location. Click on the image to see the average direction and magnitude of the re-projection error for each pixel. Note that the vectors are scaled for better visualization. The scale bar indicates the magnitude of 1 pixel error.
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⚠ 2D Keypoints Table

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	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	24902	5260
Mn	16023	555
Max	30838	8433
Mean	24238	5163

⚠ 3D Points from 2D Keypoint Matches

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	Number of 3D Points Observed
In 2 Images	1039370
In 3 Images	81210
In 4 Images	25450
In 5 Images	11815
In 6 Images	6299
In 7 Images	3896
In 8 Images	2691
In 9 Images	1811
In 10 Images	1303
In 11 Images	999
In 12 Images	730
In 13 Images	609
In 14 Images	519
In 15 Images	428
In 16 Images	375
In 17 Images	327
In 18 Images	293
In 19 Images	208

In 20 Images	195
In 21 Images	190
In 22 Images	145
In 23 Images	126
In 24 Images	114
In 25 Images	123
In 26 Images	88
In 27 Images	79
In 28 Images	72
In 29 Images	64
In 30 Images	62
In 31 Images	60
In 32 Images	59
In 33 Images	53
In 34 Images	61
In 35 Images	40
In 36 Images	67
In 37 Images	37
In 38 Images	39
In 39 Images	36
In 40 Images	31
In 41 Images	43
In 42 Images	21
In 43 Images	29
In 44 Images	29
In 45 Images	21
In 46 Images	26
In 47 Images	19
In 48 Images	14
In 49 Images	21
In 50 Images	17
In 51 Images	12
In 52 Images	23
In 53 Images	11
In 54 Images	13
In 55 Images	13
In 56 Images	14
In 57 Images	11
In 58 Images	7
In 59 Images	11
In 60 Images	13
In 61 Images	10
In 62 Images	12
In 63 Images	10
In 64 Images	13
In 65 Images	7
In 66 Images	8
In 67 Images	8
In 68 Images	11
In 69 Images	10
In 70 Images	9
In 71 Images	5
In 72 Images	14
In 73 Images	8
In 74 Images	9
In 75 Images	7
In 76 Images	2
In 77 Images	8
In 78 Images	8

In 79 Images	5
In 80 Images	4
In 81 Images	7
In 82 Images	2
In 83 Images	7
In 84 Images	3
In 85 Images	5
In 86 Images	4
In 87 Images	4
In 88 Images	2
In 89 Images	2
In 90 Images	6
In 91 Images	5
In 92 Images	3
In 93 Images	2
In 94 Images	2
In 95 Images	5
In 96 Images	2
In 97 Images	2
In 98 Images	4
In 99 Images	4
In 100 Images	2
In 102 Images	7
In 103 Images	5
In 104 Images	4
In 105 Images	2
In 106 Images	2
In 107 Images	6
In 108 Images	2
In 109 Images	3
In 111 Images	4
In 112 Images	2
In 113 Images	1
In 114 Images	2
In 115 Images	1
In 116 Images	2
In 117 Images	2
In 118 Images	1
In 119 Images	3
In 122 Images	1
In 124 Images	4
In 125 Images	4
In 126 Images	2
In 127 Images	1
In 128 Images	2
In 129 Images	1
In 130 Images	1
In 131 Images	2
In 132 Images	3
In 133 Images	1
In 134 Images	2
In 135 Images	1
In 136 Images	5
In 137 Images	2
In 138 Images	1
In 139 Images	2
In 142 Images	1
In 143 Images	2
In 144 Images	2

In 145 Images	2
In 146 Images	3
In 147 Images	2
In 148 Images	2
In 149 Images	2
In 150 Images	3
In 151 Images	1
In 152 Images	1
In 153 Images	2
In 155 Images	2
In 156 Images	2
In 157 Images	2
In 158 Images	2
In 159 Images	2
In 160 Images	2
In 161 Images	1
In 162 Images	2
In 163 Images	1
In 164 Images	2
In 165 Images	2
In 166 Images	1
In 168 Images	1
In 169 Images	1
In 170 Images	1
In 171 Images	3
In 172 Images	5
In 173 Images	1
In 175 Images	2
In 176 Images	1
In 177 Images	1
In 179 Images	1
In 180 Images	2
In 181 Images	4
In 182 Images	3
In 183 Images	1
In 188 Images	3
In 189 Images	1
In 190 Images	1
In 191 Images	4
In 195 Images	2
In 196 Images	1
In 198 Images	1
In 199 Images	1
In 200 Images	1
In 203 Images	1
In 204 Images	2
In 205 Images	2
In 206 Images	1
In 207 Images	2
In 215 Images	1
In 221 Images	2
In 225 Images	1
In 226 Images	1
In 229 Images	1
In 232 Images	1
In 236 Images	2
In 256 Images	1
In 266 Images	1

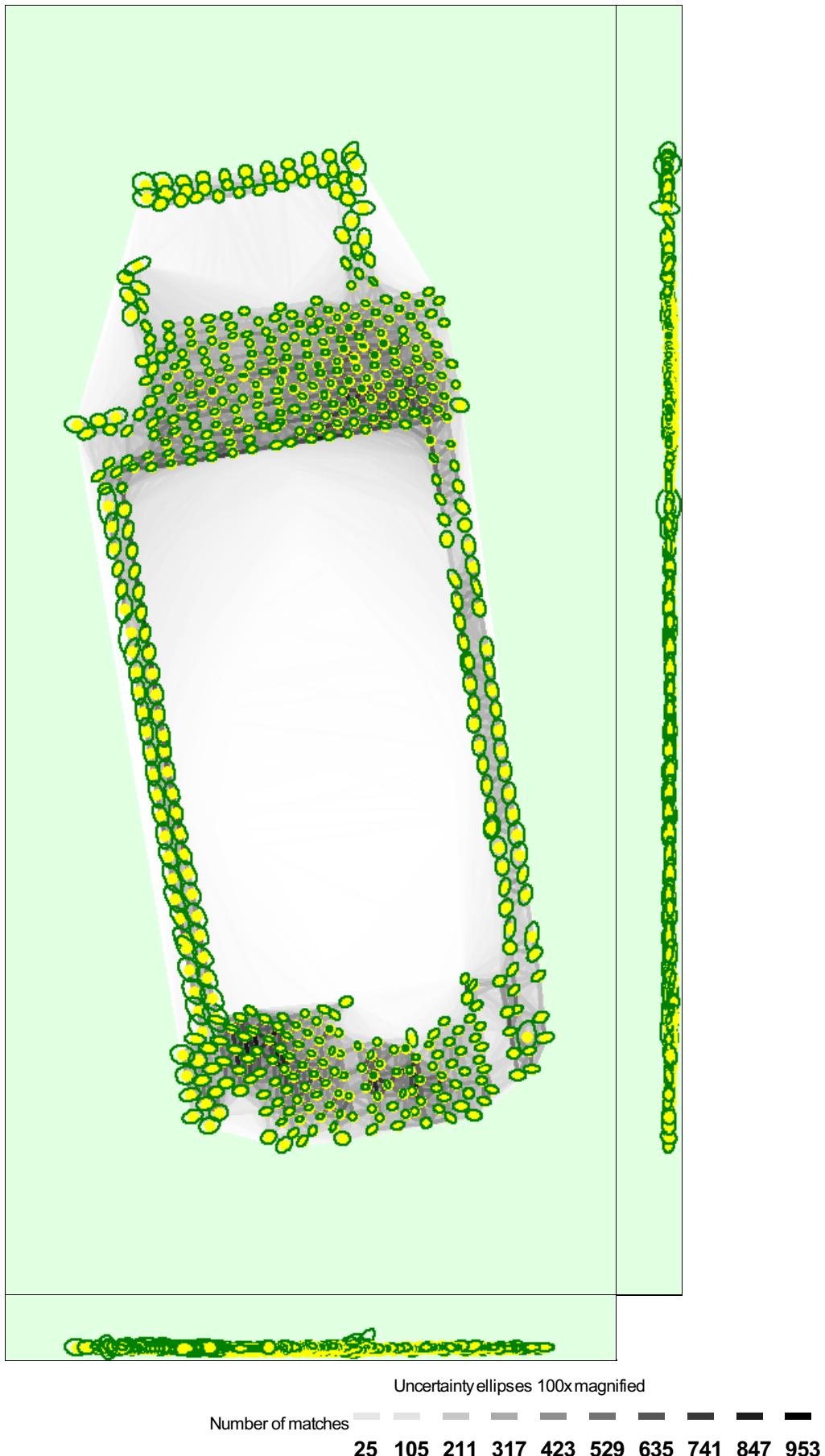


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty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

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Relative camera position and orientation uncertainties


	X[m]	Y[m]	Z[m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.003	0.003	0.002	0.088	0.014	0.036
Sigma	0.001	0.002	0.001	0.164	0.004	0.158

Geolocation Details



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Ground Control Points


GCP Name	Accuracy XY/Z [m]	Error X[m]	Error Y[m]	Error Z[m]	Projection Error [pixel]	Verified/Marked
19 (3D)	0.020/ 0.020	-0.035	0.107	-0.021	1.960	8 / 8
20 (3D)	0.020/ 0.020	0.001	0.082	0.058	1.121	8 / 8
21 (3D)	0.020/ 0.020	0.018	0.047	0.007	2.196	8 / 8
24 (3D)	0.020/ 0.020	-0.046	0.011	0.033	2.288	8 / 8
6 (3D)	0.020/ 0.020	-0.025	-0.002	0.036	2.400	8 / 8
7 (3D)	0.020/ 0.020	-0.035	-0.026	0.019	1.242	8 / 8
8 (3D)	0.020/ 0.020	-0.043	-0.026	0.038	1.970	8 / 8
9 (3D)	0.020/ 0.020	-0.026	0.018	0.008	2.593	8 / 8
10 (3D)	0.020/ 0.020	-0.020	-0.014	0.031	1.700	8 / 8
26 (3D)	0.020/ 0.020	-0.025	-0.129	-0.067	1.558	8 / 8
27 (3D)	0.020/ 0.020	-0.251	-0.108	-0.028	2.867	8 / 8
14 (3D)	0.020/ 0.020	0.204	0.070	-0.021	3.009	8 / 8
16 (3D)	0.020/ 0.020	0.267	-0.146	0.005	2.203	8 / 8
28 (3D)	0.020/ 0.020	0.036	-0.077	-0.024	2.384	8 / 8
17 (3D)	0.020/ 0.020	-0.270	0.146	-0.003	2.186	5 / 5
18 (3D)	0.020/ 0.020	-0.138	0.144	0.054	2.560	7 / 7
4 (3D)	0.020/ 0.020	-0.068	0.051	-0.018	2.135	8 / 8
5 (3D)	0.020/ 0.020	-0.009	0.052	0.008	1.496	5 / 5
22 (3D)	0.020/ 0.020	0.029	0.088	0.046	2.496	8 / 8
1 (3D)	0.020/ 0.020	0.134	-0.029	-0.043	2.776	8 / 8
2 (3D)	0.020/ 0.020	0.104	-0.015	0.076	1.733	8 / 8
3 (3D)	0.020/ 0.020	-0.056	-0.108	-0.065	1.981	8 / 8
13 (3D)	0.020/ 0.020	0.079	0.070	-0.007	4.210	8 / 8
30 (3D)	0.020/ 0.020	-0.127	0.015	-0.002	2.541	8 / 8
29 (3D)	0.020/ 0.020	-0.165	-0.053	0.020	1.571	8 / 8
23 (3D)	0.020/ 0.020	0.092	0.118	-0.107	2.410	5 / 8
25 (3D)	0.020/ 0.020	-0.080	-0.064	0.012	1.320	8 / 8
11 (3D)	0.020/ 0.020	0.029	-0.052	0.002	2.288	8 / 8
12 (3D)	0.020/ 0.020	0.010	-0.010	-0.008	1.938	8 / 8
15 (3D)	0.020/ 0.020	0.264	-0.107	-0.050	1.715	8 / 8
Mean [m]		-0.005051	0.001735	-0.000337		
Sigma [m]		0.122500	0.079788	0.039737		
RMS Error [m]		0.122604	0.079807	0.039738		

Localisation accuracy per GCP and mean errors in the three coordinate directions. The last column counts the number of calibrated images where the GCP has been automatically verified v.s. manually marked.

Initial Processing Details



System Information



Hardware	CPU: Intel(R) Core(TM) i7-9700K CPU @ 3.60GHz RAM: 16GB GPU: Intel(R) UHD Graphics 630 (Driver: 27.20.100.8681), NVIDIA GeForce RTX2070 (Driver: 27.21.14.6611)
Operating System	Windows 10 Home, 64-bit

Coordinate Systems



Ground Control Point (GCP) Coordinate System	Arbitrary(m)
Output Coordinate System	Arbitrary(m)

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: yes
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	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	01h:11m:47s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	10m:45s

Results



Number of Processed Clusters	6
Number of Generated Tiles	1
Number of 3D Densified Points	4437202
Average Density (per m ³)	1687.56