

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	100%_mgeom_mgcp_8
Processed	2021-04-30 20:05:58
Camera Model Name(s)	Insta360Pro_1.9_7680x3840 (RGB)
Average Ground Sampling Distance (GSD)	0.58 cm / 0.23 in

Quality Check



Images	median of 24911 keypoints per image	
Dataset	1073 out of 1074 images calibrated (99%), all images enabled	
Camera Optimization	0% relative difference between initial and optimized internal camera parameters	
Matching	median of 171.735 matches per calibrated image	
Georeferencing	yes, 30 GCPs (30 3D), mean RMS error = 0.321 m	

Calibration Details



Number of Calibrated Images	1073 out of 1074
Number of Geolocated Images	0 out of 1074



Initial Image Positions

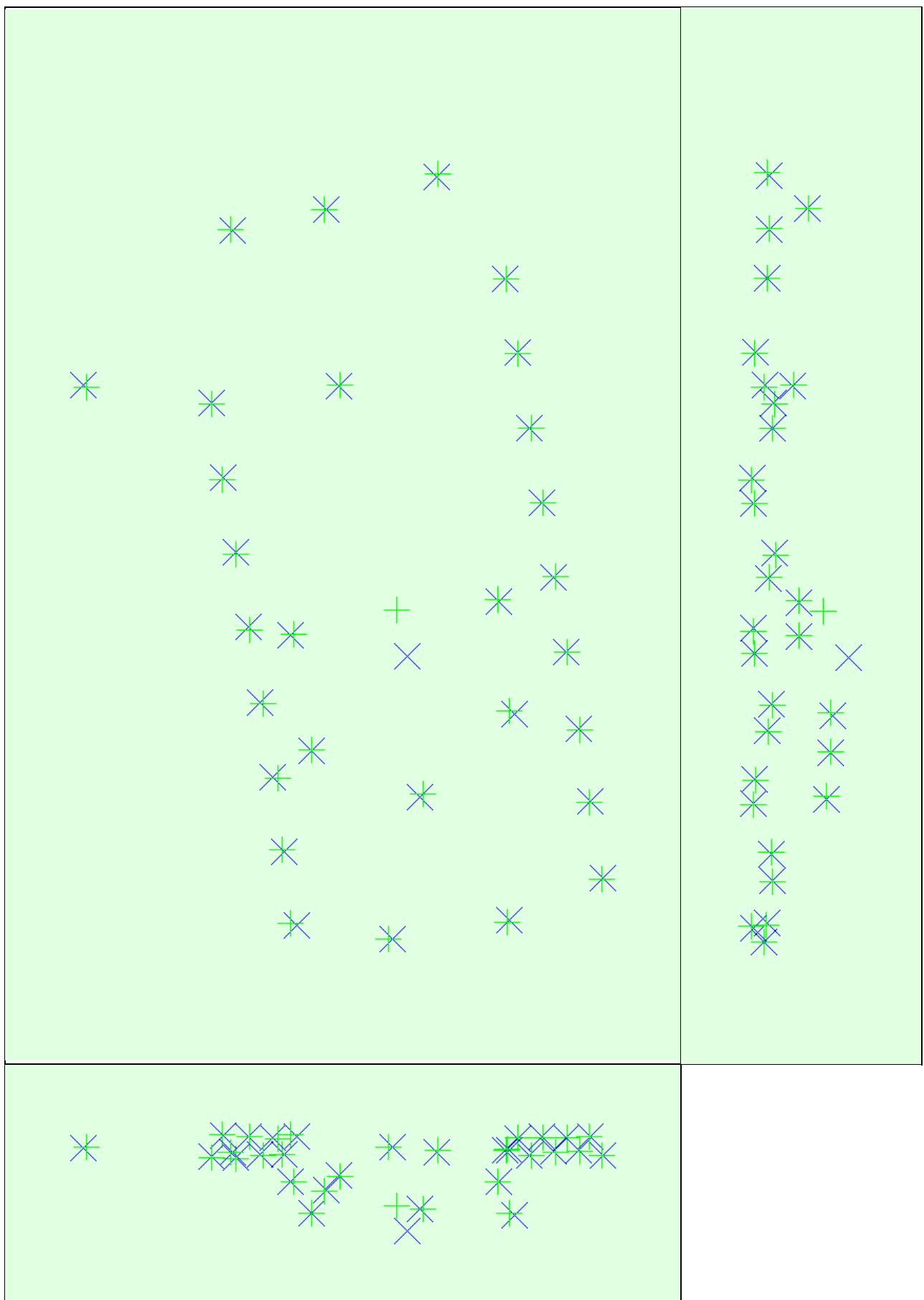


The preview is not generated for images without geolocation.



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). Red dots indicate disabled or uncalibrated images. Dark green ellipses indicate the absolute position uncertainty of the bundle block adjustment result.

	X[m]	Y[m]	Z[m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.004	0.004	0.004	0.123	0.015	0.059
Sigma	0.001	0.001	0.001	0.316	0.004	0.302

Bundle Block Adjustment Details



Number of 2D Keypoint Observations for Bundle Block Adjustment	185666
Number of 3D Points for Bundle Block Adjustment	22306
Mean Reprojection Error [pixels]	0.604

? 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.

? 2D Keypoints Table



	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	24911	172
Mn	15697	23
Max	30913	314
Mean	24236	173

? 3D Points from 2D Keypoint Matches



	Number of 3D Points Observed
In 2 Images	7168
In 3 Images	5348
In 4 Images	2989
In 5 Images	1537
In 6 Images	892
In 7 Images	609
In 8 Images	457
In 9 Images	368
In 10 Images	274
In 11 Images	236
In 12 Images	186
In 13 Images	183
In 14 Images	152
In 15 Images	109
In 16 Images	118
In 17 Images	86
In 18 Images	75
In 19 Images	64

In 20 Images	57
In 21 Images	64
In 22 Images	74
In 23 Images	49
In 24 Images	38
In 25 Images	47
In 26 Images	40
In 27 Images	31
In 28 Images	37
In 29 Images	32
In 30 Images	24
In 31 Images	27
In 32 Images	30
In 33 Images	29
In 34 Images	23
In 35 Images	22
In 36 Images	17
In 37 Images	25
In 38 Images	26
In 39 Images	22
In 40 Images	20
In 41 Images	24
In 42 Images	13
In 43 Images	15
In 44 Images	13
In 45 Images	16
In 46 Images	16
In 47 Images	21
In 48 Images	15
In 49 Images	15
In 50 Images	11
In 51 Images	18
In 52 Images	15
In 53 Images	13
In 54 Images	14
In 55 Images	13
In 56 Images	12
In 57 Images	7
In 58 Images	15
In 59 Images	6
In 60 Images	9
In 61 Images	11
In 62 Images	13
In 63 Images	7
In 64 Images	7
In 65 Images	5
In 66 Images	6
In 67 Images	8
In 68 Images	7
In 69 Images	5
In 70 Images	10
In 71 Images	9
In 72 Images	13
In 73 Images	6
In 74 Images	4
In 75 Images	5
In 76 Images	9
In 77 Images	5
In 78 Images	2

In 79 Images	9
In 80 Images	3
In 81 Images	6
In 82 Images	4
In 83 Images	6
In 84 Images	1
In 85 Images	6
In 86 Images	2
In 87 Images	7
In 88 Images	1
In 89 Images	3
In 90 Images	3
In 91 Images	2
In 92 Images	4
In 93 Images	4
In 94 Images	2
In 95 Images	3
In 96 Images	4
In 97 Images	3
In 98 Images	1
In 99 Images	1
In 100 Images	3
In 101 Images	4
In 102 Images	2
In 103 Images	4
In 104 Images	3
In 105 Images	1
In 106 Images	2
In 107 Images	1
In 108 Images	2
In 109 Images	2
In 110 Images	3
In 112 Images	3
In 113 Images	4
In 114 Images	4
In 116 Images	1
In 117 Images	3
In 118 Images	3
In 119 Images	3
In 121 Images	5
In 122 Images	3
In 124 Images	2
In 125 Images	1
In 127 Images	1
In 128 Images	2
In 129 Images	1
In 130 Images	2
In 131 Images	3
In 132 Images	1
In 134 Images	3
In 135 Images	1
In 136 Images	1
In 137 Images	2
In 138 Images	1
In 141 Images	1
In 143 Images	4
In 144 Images	2
In 145 Images	1
In 146 Images	1

In 147 Images	1
In 148 Images	2
In 149 Images	3
In 150 Images	3
In 151 Images	2
In 152 Images	3
In 153 Images	1
In 154 Images	3
In 157 Images	3
In 159 Images	1
In 165 Images	2
In 168 Images	1
In 170 Images	1
In 171 Images	1
In 172 Images	1
In 173 Images	1
In 174 Images	2
In 175 Images	1
In 176 Images	1
In 179 Images	1
In 181 Images	1
In 182 Images	1
In 183 Images	3
In 184 Images	1
In 188 Images	1
In 189 Images	1
In 190 Images	2
In 191 Images	1
In 192 Images	2
In 195 Images	3
In 204 Images	1
In 208 Images	3
In 209 Images	2
In 212 Images	1
In 214 Images	2
In 215 Images	1
In 217 Images	1
In 218 Images	1
In 219 Images	1
In 220 Images	3
In 223 Images	1
In 224 Images	1
In 226 Images	1
In 228 Images	1
In 229 Images	1
In 232 Images	2
In 234 Images	1
In 239 Images	1
In 240 Images	1
In 241 Images	1
In 246 Images	1
In 251 Images	1
In 252 Images	1
In 253 Images	2
In 256 Images	1
In 259 Images	1
In 260 Images	1
In 261 Images	1
In 262 Images	2

In 263 Images	1
In 267 Images	1
In 274 Images	1
In 278 Images	1
In 280 Images	1
In 286 Images	1
In 287 Images	1
In 288 Images	1
In 289 Images	1
In 290 Images	1
In 294 Images	1
In 300 Images	1
In 301 Images	2
In 304 Images	1
In 307 Images	1
In 310 Images	1
In 321 Images	1
In 323 Images	1
In 327 Images	1
In 337 Images	1
In 343 Images	1
In 347 Images	1
In 352 Images	1
In 356 Images	1
In 357 Images	1
In 370 Images	1
In 371 Images	1
In 379 Images	1
In 381 Images	1
In 387 Images	1
In 388 Images	1
In 395 Images	1
In 402 Images	1
In 406 Images	1
In 408 Images	1
In 409 Images	1
In 410 Images	2
In 412 Images	1
In 416 Images	1
In 423 Images	1
In 424 Images	1
In 427 Images	1
In 432 Images	1
In 436 Images	2
In 442 Images	1
In 443 Images	2
In 445 Images	1
In 451 Images	1
In 456 Images	1
In 460 Images	1
In 480 Images	1
In 487 Images	1
In 500 Images	1
In 508 Images	1
In 514 Images	1

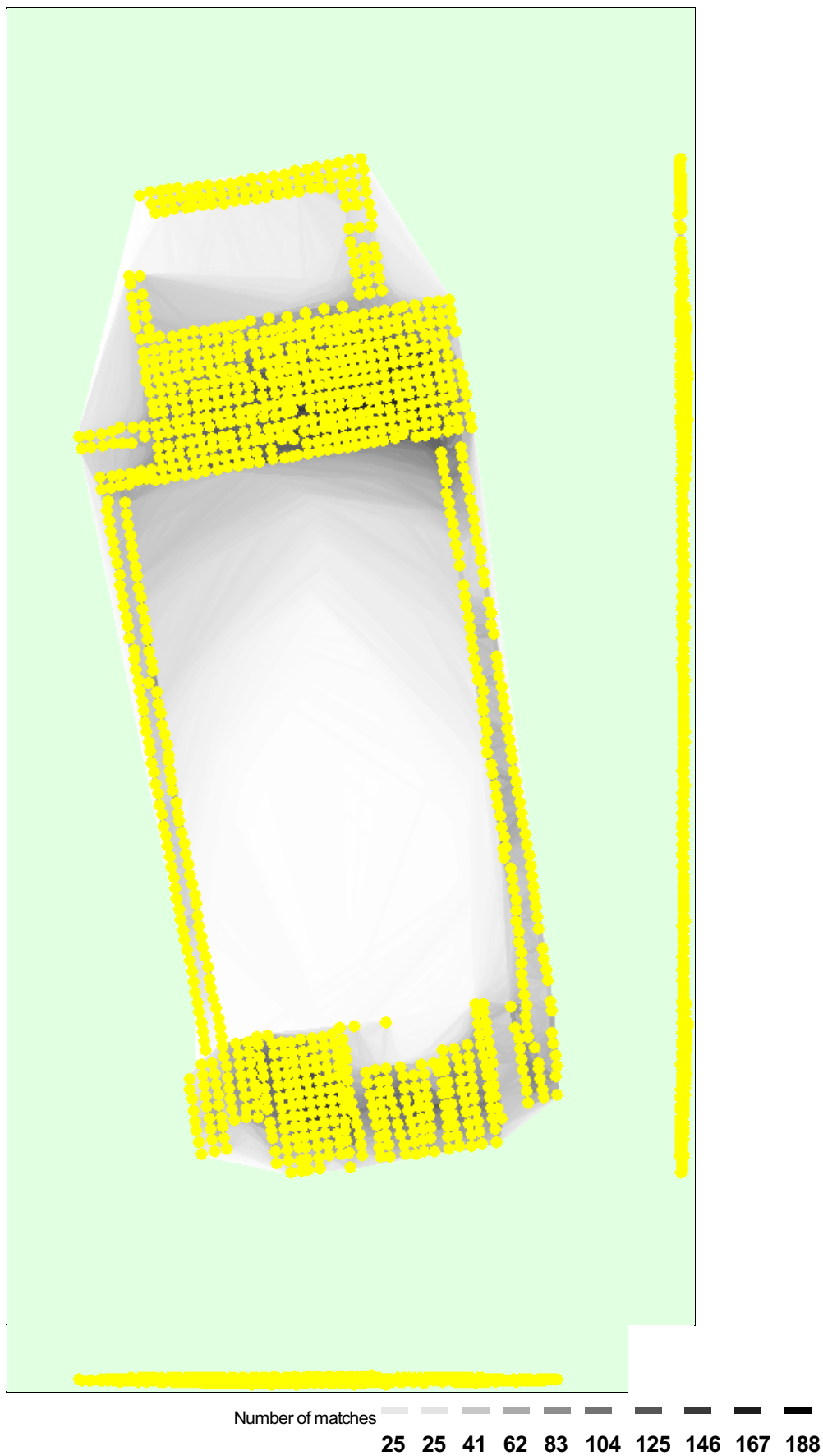


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images.

Geolocation Details



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	-0.083	0.144	-0.001	5.745	8 / 8
20 (3D)	0.020/ 0.020	0.025	0.133	0.076	7.417	8 / 8
21 (3D)	0.020/ 0.020	0.090	0.125	-0.061	6.916	8 / 8
24 (3D)	0.020/ 0.020	-0.043	-0.014	0.028	1.847	8 / 8
6 (3D)	0.020/ 0.020	-0.084	0.011	0.034	3.360	8 / 8
7 (3D)	0.020/ 0.020	-0.059	-0.011	0.041	2.381	8 / 8
8 (3D)	0.020/ 0.020	-0.065	-0.002	0.044	2.448	8 / 8
9 (3D)	0.020/ 0.020	-0.067	0.009	-0.002	6.758	8 / 8
10 (3D)	0.020/ 0.020	-0.033	0.019	0.049	4.591	8 / 8
26 (3D)	0.020/ 0.020	0.272	-0.158	-0.160	3.144	8 / 8
27 (3D)	0.020/ 0.020	-0.222	-0.216	-0.040	1.466	8 / 8
14 (3D)	0.020/ 0.020	0.262	0.013	-0.009	5.345	8 / 8
16 (3D)	0.020/ 0.020	0.160	-0.142	0.004	7.071	7 / 7
28 (3D)	0.020/ 0.020	0.012	-0.117	0.014	2.072	8 / 8
17 (3D)	0.020/ 0.020	-0.327	0.062	0.042	4.940	8 / 8
18 (3D)	0.020/ 0.020	-0.170	0.111	0.060	6.979	8 / 8
4 (3D)	0.020/ 0.020	-0.047	0.007	-0.041	2.216	8 / 8
5 (3D)	0.020/ 0.020	-0.032	0.023	-0.028	3.709	8 / 8
22 (3D)	0.020/ 0.020	-0.011	0.079	0.063	3.165	8 / 8
1 (3D)	0.020/ 0.020	0.124	-0.074	-0.023	5.672	8 / 8
2 (3D)	0.020/ 0.020	0.097	-0.025	0.049	1.542	8 / 8
3 (3D)	0.020/ 0.020	-0.038	-0.167	-0.092	6.225	8 / 8
13 (3D)	0.020/ 0.020	0.137	0.138	-0.021	11.387	8 / 8
30 (3D)	0.020/ 0.020	0.614	-2.769	-1.498	1.441	8 / 8
29 (3D)	0.020/ 0.020	-0.210	-0.077	0.031	1.732	8 / 8
23 (3D)	0.020/ 0.020	-0.205	0.162	-0.057	3.427	8 / 8
25 (3D)	0.020/ 0.020	0.020	-0.094	0.007	1.019	8 / 8
11 (3D)	0.020/ 0.020	0.049	0.029	0.011	2.620	8 / 8
12 (3D)	0.020/ 0.020	0.061	0.074	-0.003	2.219	8 / 8
15 (3D)	0.020/ 0.020	0.335	-0.084	-0.092	7.301	8 / 8
Mean [m]		0.018701	-0.093699	-0.052541		
Sigma [m]		0.183502	0.506385	0.273341		
RMS Error [m]		0.184452	0.514981	0.278345		

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	04h:49m:41s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	20m:38s

Results



Number of Processed Clusters	7
Number of Generated Tiles	1
Number of 3D Densified Points	6645582
Average Density (per m ³)	3398.11