

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%_ugeom_mgcp_8
Processed	2021-05-12 01:24:00
Camera Model Name(s)	Insta360Pro_1.9_7680x3840 (RGB)
Average Ground Sampling Distance (GSD)	0.73 cm / 0.29 in
Time for Initial Processing (without report)	01h:07m:16s

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 157.081 matches per calibrated image	
Georeferencing	yes, 30 GCPs (30 3D), mean RMS error = 0.111 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



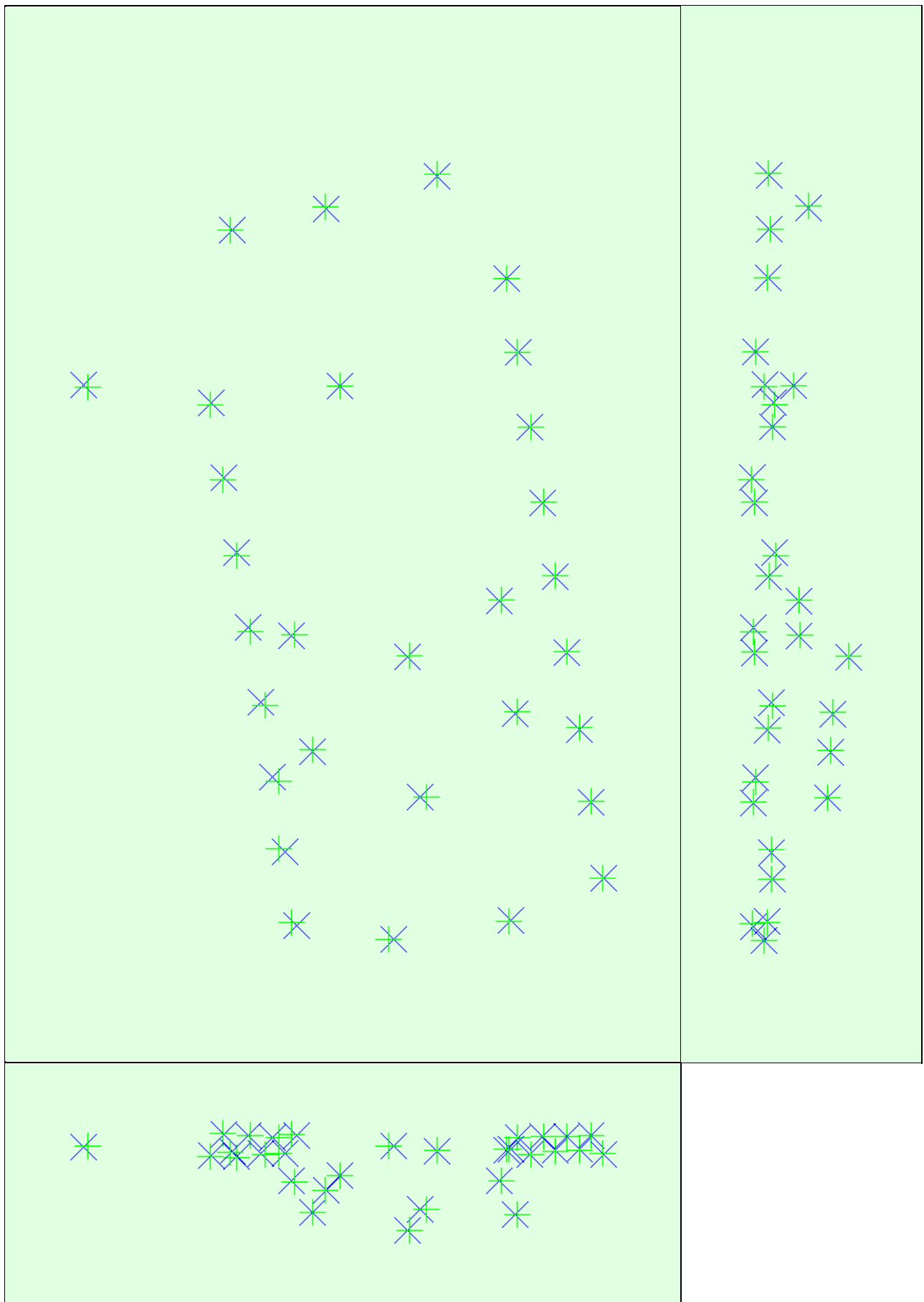


Figure 3: Offset between initial (blue dots) and computed (green dots) image positions as well as the offset between the GCPs initial positions (blue crosses) and their computed positions (green crosses) in the top-view (XY plane), front-view (XZ plane), and side-view (YZ plane). Dark green ellipses 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	0.005	0.005	0.004	0.132	0.018	0.055
Sigma	0.001	0.001	0.001	0.280	0.004	0.252

Bundle Block Adjustment Details



Number of 2D Keypoint Observations for Bundle Block Adjustment	83417
Number of 3D Points for Bundle Block Adjustment	11831
Mean Reprojection Error [pixels]	0.590

? 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	24902	157
Mn	16023	25
Max	30838	275
Mean	24238	155

? 3D Points from 2D Keypoint Matches



	Number of 3D Points Observed
In 2 Images	5188
In 3 Images	2930
In 4 Images	1049
In 5 Images	522
In 6 Images	306
In 7 Images	208
In 8 Images	165
In 9 Images	113
In 10 Images	95
In 11 Images	91
In 12 Images	70
In 13 Images	63
In 14 Images	76
In 15 Images	44
In 16 Images	55
In 17 Images	50
In 18 Images	41
In 19 Images	31

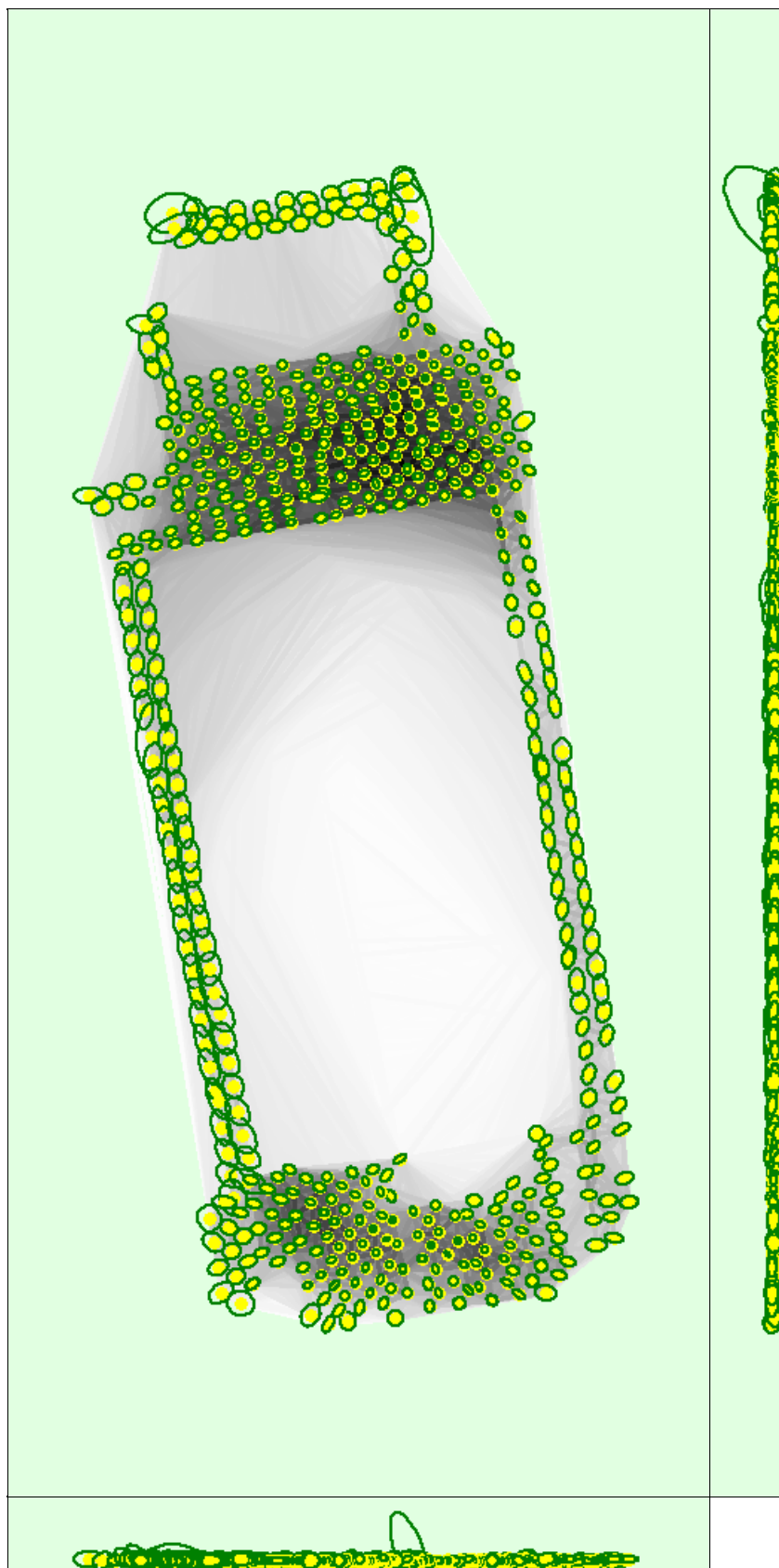
In 20 Images	33
In 21 Images	22
In 22 Images	27
In 23 Images	34
In 24 Images	24
In 25 Images	25
In 26 Images	26
In 27 Images	21
In 28 Images	25
In 29 Images	18
In 30 Images	13
In 31 Images	12
In 32 Images	13
In 33 Images	18
In 34 Images	13
In 35 Images	10
In 36 Images	11
In 37 Images	16
In 38 Images	8
In 39 Images	10
In 40 Images	15
In 41 Images	14
In 42 Images	10
In 43 Images	10
In 44 Images	8
In 45 Images	10
In 46 Images	7
In 47 Images	9
In 48 Images	7
In 49 Images	5
In 50 Images	3
In 51 Images	8
In 52 Images	5
In 53 Images	12
In 54 Images	4
In 55 Images	3
In 56 Images	4
In 57 Images	7
In 58 Images	6
In 59 Images	3
In 60 Images	5
In 61 Images	3
In 62 Images	5
In 63 Images	3
In 64 Images	2
In 65 Images	5
In 66 Images	3
In 67 Images	3
In 68 Images	1
In 69 Images	4
In 70 Images	1
In 72 Images	4
In 73 Images	2
In 74 Images	4
In 75 Images	5
In 76 Images	1
In 77 Images	2
In 79 Images	3
In 81 Images	1

In 82 Images	3
In 83 Images	2
In 84 Images	1
In 85 Images	2
In 86 Images	1
In 87 Images	1
In 88 Images	2
In 89 Images	2
In 91 Images	5
In 92 Images	3
In 93 Images	1
In 94 Images	2
In 95 Images	2
In 96 Images	1
In 97 Images	3
In 98 Images	1
In 99 Images	3
In 100 Images	2
In 102 Images	3
In 104 Images	1
In 105 Images	3
In 107 Images	1
In 108 Images	2
In 110 Images	1
In 112 Images	2
In 114 Images	2
In 117 Images	3
In 118 Images	3
In 120 Images	1
In 121 Images	1
In 122 Images	2
In 124 Images	2
In 125 Images	1
In 126 Images	1
In 128 Images	1
In 131 Images	2
In 132 Images	4
In 133 Images	1
In 137 Images	1
In 138 Images	2
In 140 Images	1
In 142 Images	1
In 143 Images	3
In 144 Images	1
In 147 Images	2
In 148 Images	1
In 150 Images	1
In 151 Images	1
In 154 Images	2
In 155 Images	2
In 158 Images	1
In 159 Images	1
In 160 Images	1
In 161 Images	1
In 162 Images	1
In 164 Images	1
In 168 Images	1
In 171 Images	1
In 172 Images	2

In 176 Images	1
In 179 Images	2
In 180 Images	1
In 184 Images	1
In 186 Images	1
In 187 Images	3
In 193 Images	1
In 194 Images	1
In 196 Images	1
In 201 Images	4
In 205 Images	2
In 206 Images	1
In 208 Images	1
In 214 Images	1
In 216 Images	2
In 217 Images	2
In 223 Images	1
In 225 Images	1
In 226 Images	1
In 227 Images	2
In 228 Images	3
In 230 Images	1
In 231 Images	1
In 232 Images	1
In 238 Images	1
In 244 Images	3
In 245 Images	1
In 247 Images	1
In 258 Images	1
In 259 Images	1
In 260 Images	1
In 296 Images	1

2D Keypoint Matches





Uncertainty ellipses 100x magnified

Number of matches

25	25	36	55	73	91	110	128	146	165
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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]
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Mean	0.003	0.003	0.002	0.099	0.016	0.041
Sigma	0.001	0.002	0.001	0.204	0.005	0.181

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	-0.090	0.234	-0.014	3.351	8 / 8
20 (3D)	0.020/ 0.020	-0.014	0.199	0.047	2.215	8 / 8
21 (3D)	0.020/ 0.020	0.054	0.150	-0.034	3.077	8 / 8
24 (3D)	0.020/ 0.020	-0.027	-0.001	-0.001	2.731	8 / 8
6 (3D)	0.020/ 0.020	-0.013	-0.044	0.019	3.751	8 / 8
7 (3D)	0.020/ 0.020	-0.029	-0.064	0.023	1.996	8 / 8
8 (3D)	0.020/ 0.020	-0.029	-0.055	0.056	2.666	8 / 8
9 (3D)	0.020/ 0.020	-0.016	-0.039	0.015	4.546	8 / 8
10 (3D)	0.020/ 0.020	-0.010	-0.080	0.036	2.713	8 / 8
26 (3D)	0.020/ 0.020	-0.110	-0.129	-0.043	1.958	8 / 8
27 (3D)	0.020/ 0.020	-0.390	-0.049	0.013	3.174	8 / 8
14 (3D)	0.020/ 0.020	0.270	0.030	-0.019	5.260	8 / 8
16 (3D)	0.020/ 0.020	0.388	-0.218	0.005	5.352	8 / 8
28 (3D)	0.020/ 0.020	-0.009	-0.130	-0.019	2.381	8 / 8
17 (3D)	0.020/ 0.020	-0.365	0.277	0.010	3.048	5 / 5
18 (3D)	0.020/ 0.020	-0.232	0.214	0.065	4.592	7 / 7
4 (3D)	0.020/ 0.020	-0.026	0.016	-0.040	2.107	8 / 8
5 (3D)	0.020/ 0.020	0.030	0.005	-0.012	1.657	5 / 5
22 (3D)	0.020/ 0.020	0.064	0.138	0.054	5.394	8 / 8
1 (3D)	0.020/ 0.020	0.129	-0.015	0.014	5.592	8 / 8
2 (3D)	0.020/ 0.020	0.068	-0.147	0.039	7.323	8 / 8
3 (3D)	0.020/ 0.020	0.054	-0.144	-0.062	8.248	8 / 8
13 (3D)	0.020/ 0.020	0.121	0.058	-0.024	6.377	8 / 8
30 (3D)	0.020/ 0.020	-0.135	-0.024	-0.008	2.502	8 / 8
29 (3D)	0.020/ 0.020	-0.222	-0.063	0.022	1.883	8 / 8
23 (3D)	0.020/ 0.020	-0.242	0.173	-0.071	6.044	8 / 8
25 (3D)	0.020/ 0.020	-0.159	-0.068	0.019	1.865	8 / 8
11 (3D)	0.020/ 0.020	0.039	-0.064	-0.011	3.727	8 / 8
12 (3D)	0.020/ 0.020	0.038	-0.011	-0.027	2.742	8 / 8
15 (3D)	0.020/ 0.020	0.344	-0.168	-0.043	2.301	8 / 8
Mean [m]		-0.017326	-0.000771	0.000255		
Sigma [m]		0.172995	0.126089	0.034554		
RMS Error [m]		0.173861	0.126091	0.034555		

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)
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Operating System	Windows 10 Home, 64-bit
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Coordinate Systems



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

Processing Options



Detected Template	3D Models
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, 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:58m:58s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	10m:24s

Results



Number of Processed Clusters	4
Number of Generated Tiles	1
Number of 3D Densified Points	3792811
Average Density (per m ³)	1891.86