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Help to analyze the results in the Quality Report



Additional information about the sections



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Summary



Project	Dajia
Processed	2021-07-12 13:34:51
Camera Model Name(s)	ZenmuseP1_35.0_8192x5460 (3XVDJ22001Z11F/00SY118G036P) (RGB)
Average Ground Sampling Distance (GSD)	2.47 cm / 0.97 in
Time for Initial Processing (without report)	22m:36s

Quality Check



 Images	median of 29472 keypoints per image	
 Dataset	773 out of 773 images calibrated (100%), all images enabled	
 Camera Optimization	3.21% relative difference between initial and optimized internal camera parameters	
 Matching	median of 9426.89 matches per calibrated image	
 Georeferencing	yes, 4 GCPs (4 3D), mean RMS error = 0.007 m	

Calibration Details



Number of Calibrated Images	773 out of 773
Number of Geolocated Images	773 out of 773



Initial Image Positions



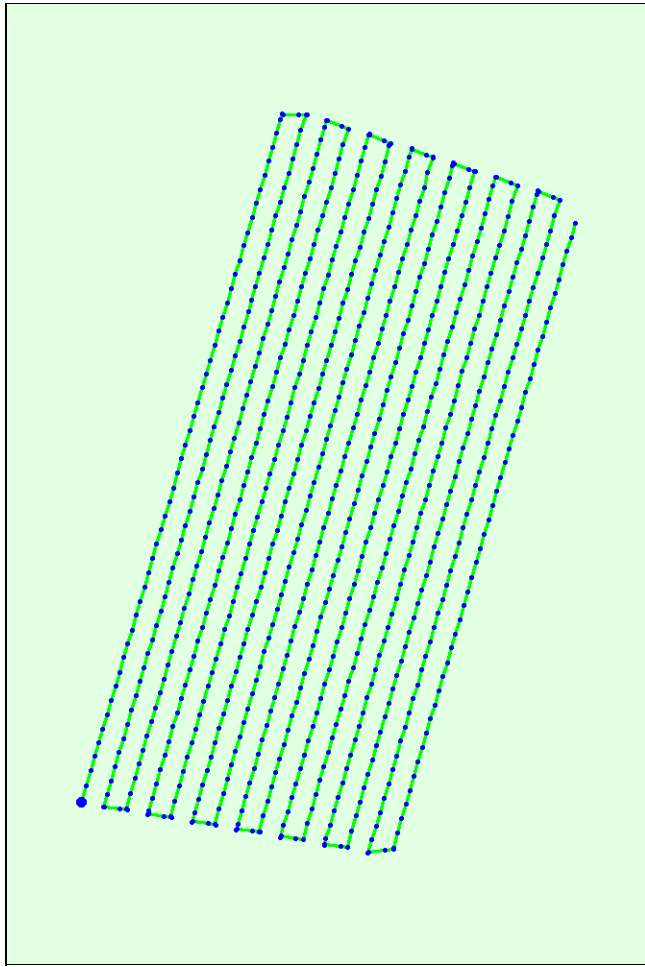
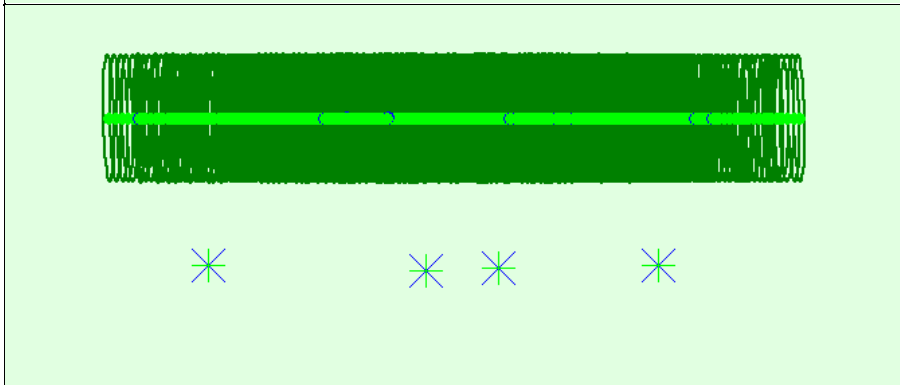
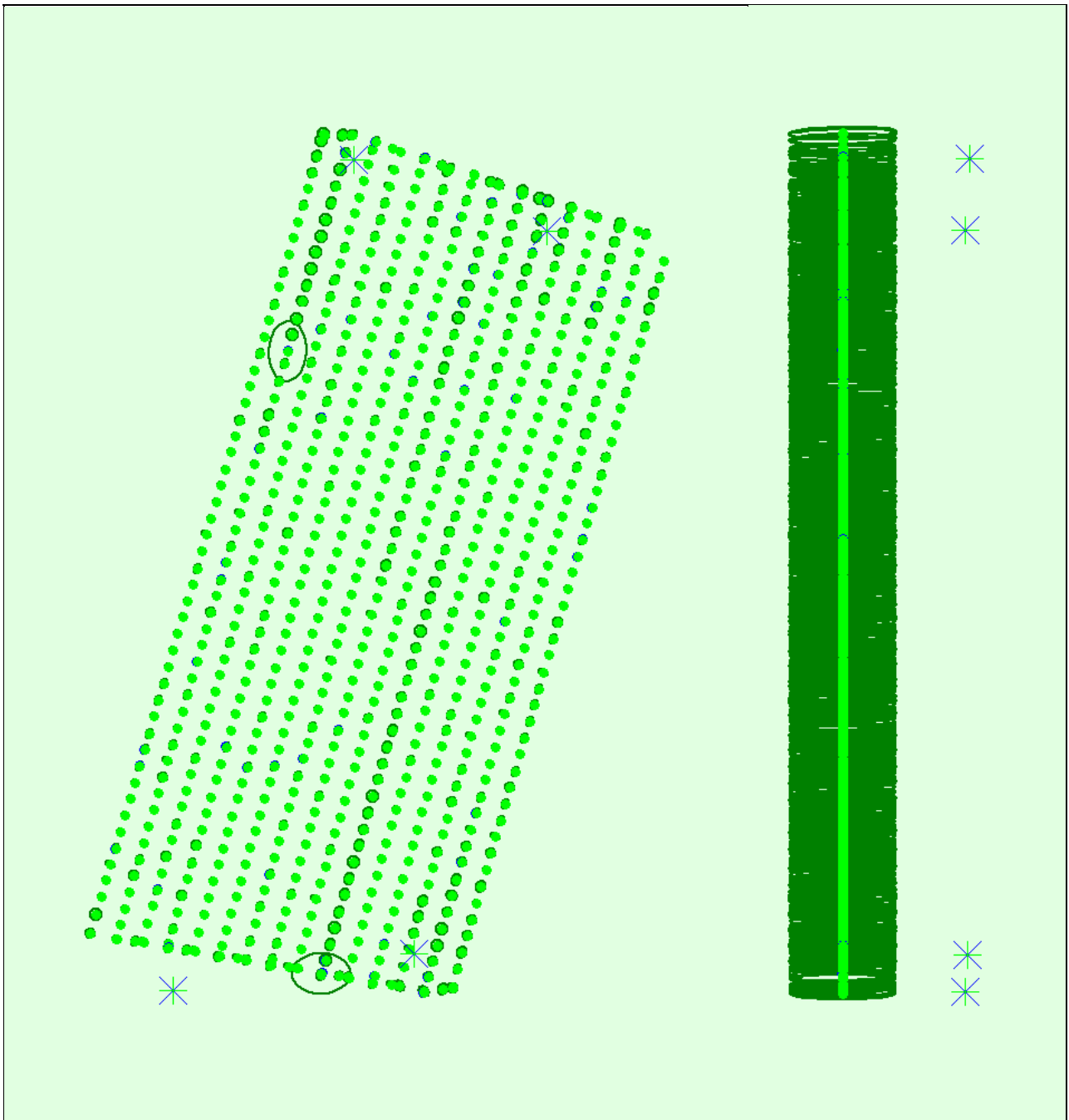


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

 **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). 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	0.007	0.007	0.084	0.002	0.002	0.003
Sigma	0.002	0.002	0.000	0.001	0.000	0.001

Bundle Block Adjustment Details

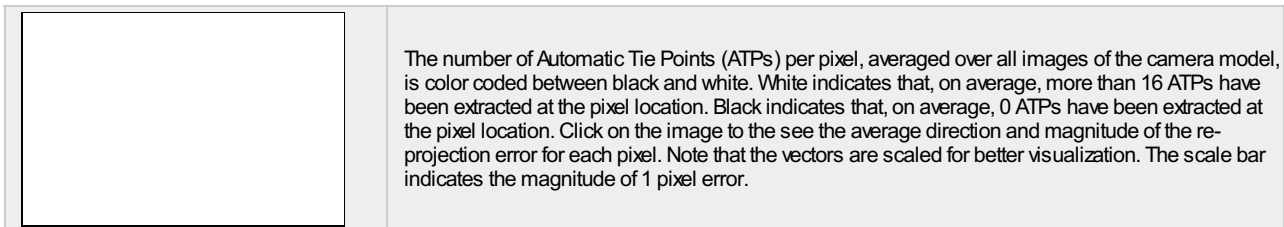
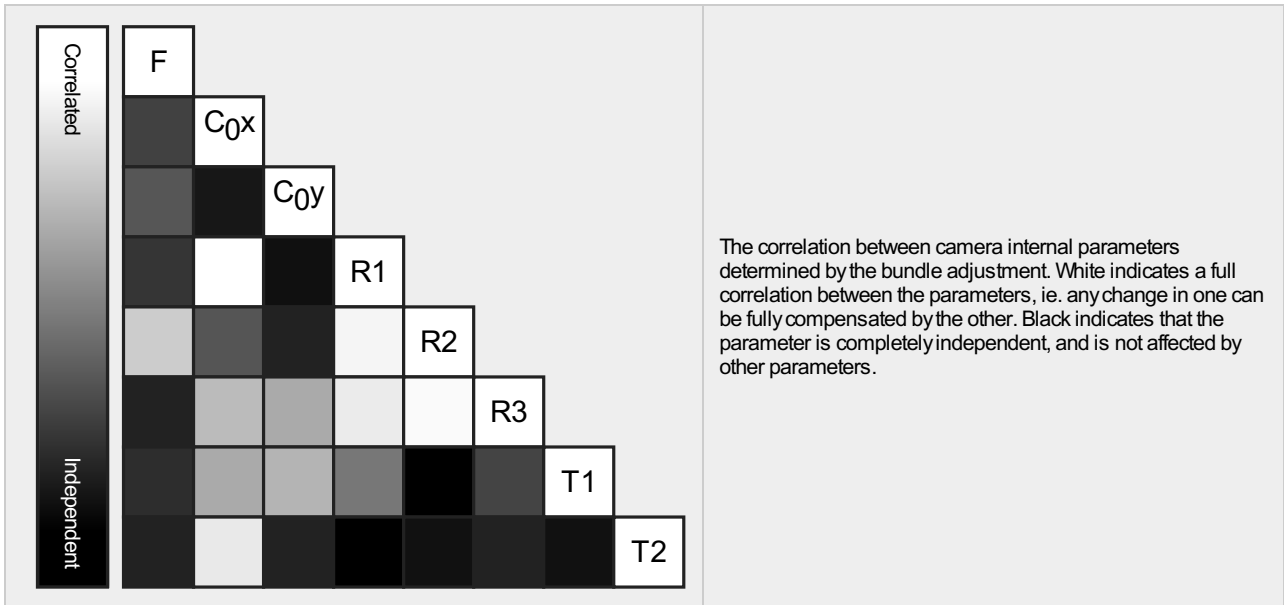
Number of 2D Keypoint Observations for Bundle Block Adjustment	7900823
Number of 3D Points for Bundle Block Adjustment	2399901
Mean Reprojection Error [pixels]	0.083

Internal Camera Parameters

ZenmuseP1_35.0_8192x5460 (3XMDJ22001Z11F/00SY118G036P) (RGB). Sensor Dimensions: 36.045 [mm] x 24.024 [mm]

EXIF ID: ZenmuseP1_35.0_8192x5460

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	7956.820 [pixel] 35.010 [mm]	4096.000 [pixel] 18.022 [mm]	2730.000 [pixel] 12.012 [mm]	-0.048	0.021	-0.097	0.002	-0.001
Optimized Values	8212.821 [pixel] 36.136 [mm]	4088.480 [pixel] 17.989 [mm]	2776.346 [pixel] 12.216 [mm]	-0.050	0.029	-0.117	0.002	-0.001
Uncertainties (Sigma)	3.479 [pixel] 0.015 [mm]	0.205 [pixel] 0.001 [mm]	0.149 [pixel] 0.001 [mm]	0.000	0.001	0.002	0.000	0.000



2D Keypoints Table

	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	29472	9427
Mn	15995	1608
Max	46898	25475
Mean	30539	10221

3D Points from 2D Keypoint Matches



	Number of 3D Points Observed
In 2 Images	1324000
In 3 Images	470033
In 4 Images	225764
In 5 Images	127791
In 6 Images	71342
In 7 Images	46195
In 8 Images	32491
In 9 Images	23910
In 10 Images	18317
In 11 Images	11970
In 12 Images	9401
In 13 Images	7762
In 14 Images	6252
In 15 Images	4788
In 16 Images	3436
In 17 Images	2898
In 18 Images	2557
In 19 Images	2433
In 20 Images	1981
In 21 Images	1499
In 22 Images	1503
In 23 Images	1431
In 24 Images	1330
In 25 Images	671
In 26 Images	47
In 27 Images	34
In 28 Images	35
In 29 Images	17
In 30 Images	12
In 31 Images	1

2D Keypoint Matches



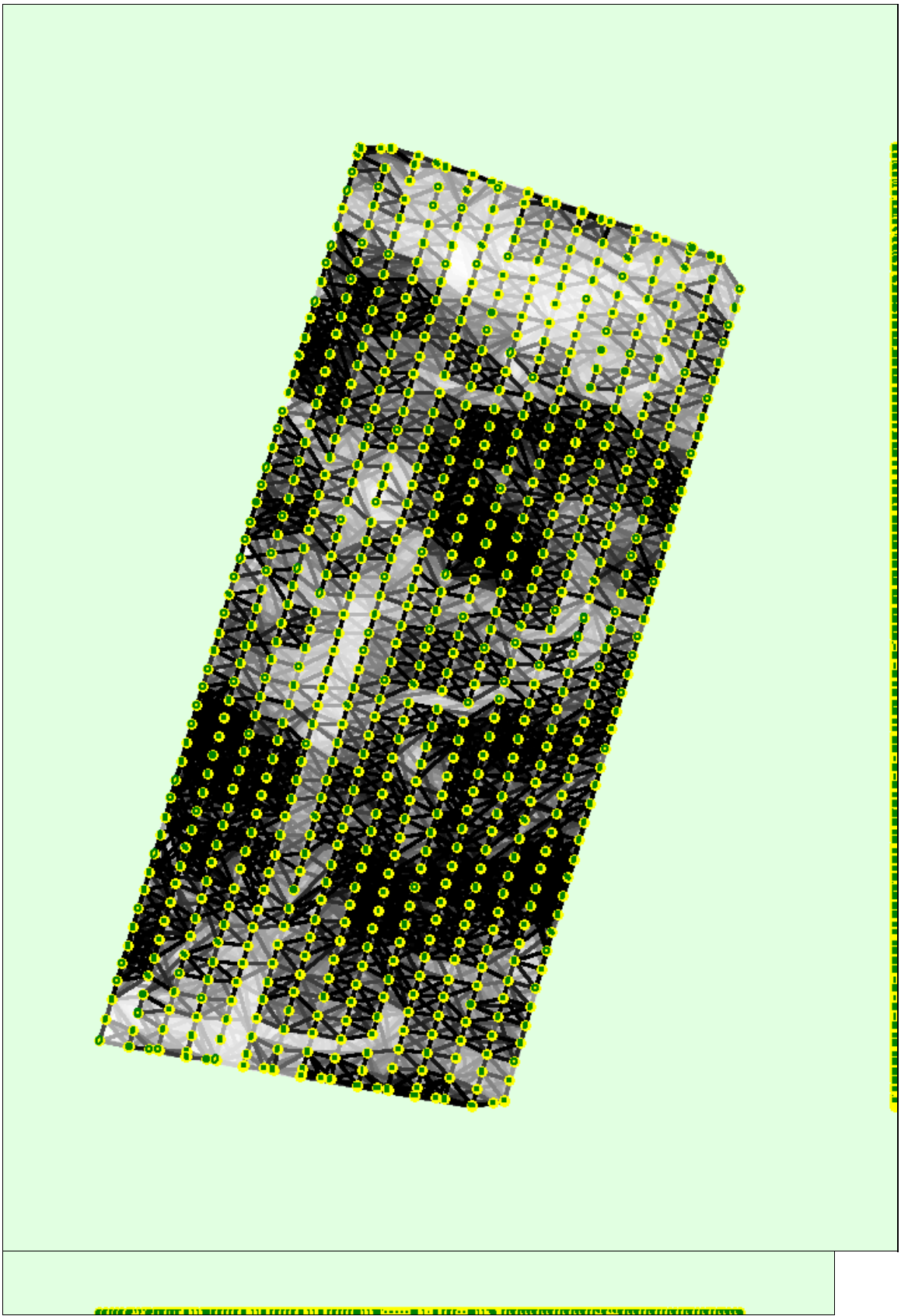


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty 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	0.023	0.030	0.013	0.008	0.007	0.002
Sigma	0.004	0.005	0.003	0.001	0.001	0.000

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
E25 (3D)	0.020/ 0.020	-0.005	0.006	0.007	0.346	29 / 29
E27 (3D)	0.020/ 0.020	0.004	0.005	-0.002	0.259	25 / 25
E28 (3D)	0.020/ 0.020	0.006	0.001	-0.015	0.218	9 / 9
E29 (3D)	0.020/ 0.020	-0.006	-0.015	0.003	0.327	31 / 31
Mean [m]		-0.000048	-0.000665	-0.001813		
Sigma [m]		0.005139	0.008338	0.008289		
RMS Error [m]		0.005139	0.008364	0.008485		

0 out of 2 check points have been labeled as inaccurate.

Check Point Name	Accuracy XY/Z [m]	Error X [m]	Error Y [m]	Error Z [m]	Projection Error [pixel]	Verified/Marked
E26		-0.0591	0.0171	-0.0975	0.2475	28 / 28
baseDJ		-0.0168	-0.0027	-0.0421	0.3511	28 / 28
Mean [m]		-0.037957	0.007208	-0.069778		
Sigma [m]		0.021139	0.009939	0.027704		
RMS Error [m]		0.043446	0.012278	0.075076		

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 vs. manually marked.

Absolute Geolocation Variance



Mn Error [m]	Max Error [m]	Geolocation Error X [%]	Geolocation Error Y [%]	Geolocation Error Z [%]
-	-4.40	0.00	0.00	0.00
-4.40	-3.52	0.00	0.00	0.00
-3.52	-2.64	0.00	0.00	0.00
-2.64	-1.76	0.00	0.00	0.00
-1.76	-0.88	0.00	0.00	0.00
-0.88	0.00	50.45	51.10	51.36
0.00	0.88	49.42	48.77	48.64
0.88	1.76	0.00	0.13	0.00
1.76	2.64	0.13	0.00	0.00
2.64	3.52	0.00	0.00	0.00
3.52	4.40	0.00	0.00	0.00
4.40	-	0.00	0.00	0.00
Mean [m]		-0.075628	0.040725	-0.231557
Sigma [m]		0.078743	0.065334	0.036185
RMS Error [m]		0.109179	0.076987	0.234367

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.

Geolocation Bias	X	Y	Z
Translation [m]	-0.079227	0.037792	-0.233454

Bias between image initial and computed geolocation given in output coordinate system.

Relative Geolocation Variance



Relative Geolocation Error	Images X[%]	Images Y[%]	Images Z[%]
[-1.00, 1.00]	99.87	99.87	99.09
[-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]	0.015466	0.015466	0.040015
Sigma of Geolocation Accuracy [m]	0.054782	0.054782	0.142236

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

Geolocation Orientational Variance	RMS [degree]
Omega	134.937
Phi	0.598
Kappa	42.001

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) i7-10700 CPU @ 2.90GHz RAM: 32GB GPU: NVIDIA GeForce RTX 2070 SUPER (Driver: 27.21.14.6627)
Operating System	Windows 10 Pro for Workstations, 64-bit

Coordinate Systems



Image Coordinate System	WGS 84
Ground Control Point (GCP) Coordinate System	TWD97 / TM2 zone 121
Output Coordinate System	TWD97 / TM2 zone 121

Processing Options



Detected Template	No Template Available
Keypoints Image Scale	Full, 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	04h:08m:49s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	35m:21s

Results



Number of Processed Clusters	3
Number of Generated Tiles	10
Number of 3D Densified Points	208378180
Average Density (per m ³)	199.65

DSM, Orthomosaic and Index Details



Processing Options



DSM and Orthomosaic Resolution	5 [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	19m:08s
Time for Orthomosaic Generation	02h:07m:40s
Time for DTM Generation	00s
Time for Contour Lines Generation	00s
Time for Reflectance Map Generation	00s
Time for Index Map Generation	00s