

- !** **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 i

Project	tw_miaoli_tongshiao_zhuntu-river_20191210
Processed	2019-12-21 08:28:04
Camera Model Name(s)	FC6310R_8.8_4864x3648 (RGB)
Average Ground Sampling Distance (GSD)	3.44 cm / 1.36 in
Area Covered	0.212 km ² / 21.1542 ha / 0.08 sq. mi. / 52.3003 acres
Time for Initial Processing (without report)	37m:00s

Quality Check i

? Images	median of 51009 keypoints per image	✓
? Dataset	207 out of 207 images calibrated (100%), all images enabled	✓
? Camera Optimization	0.45% relative difference between initial and optimized internal camera parameters	✓
? Matching	median of 17134.4 matches per calibrated image	✓
? Georeferencing	yes, no 3D GCP	⚠

? Preview i

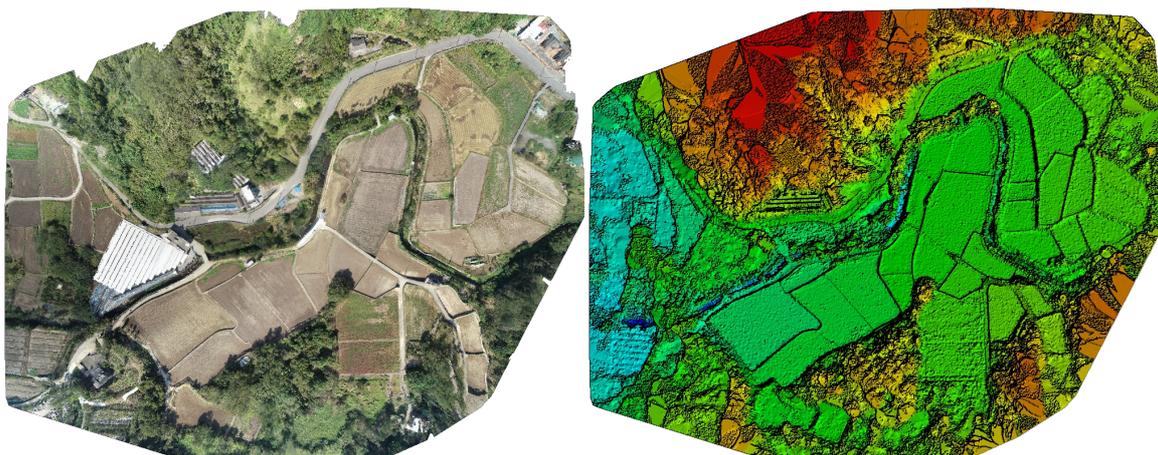


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

Calibration Details i

Number of Calibrated Images	207 out of 207
Number of Geolocated Images	207 out of 207

? Initial Image Positions

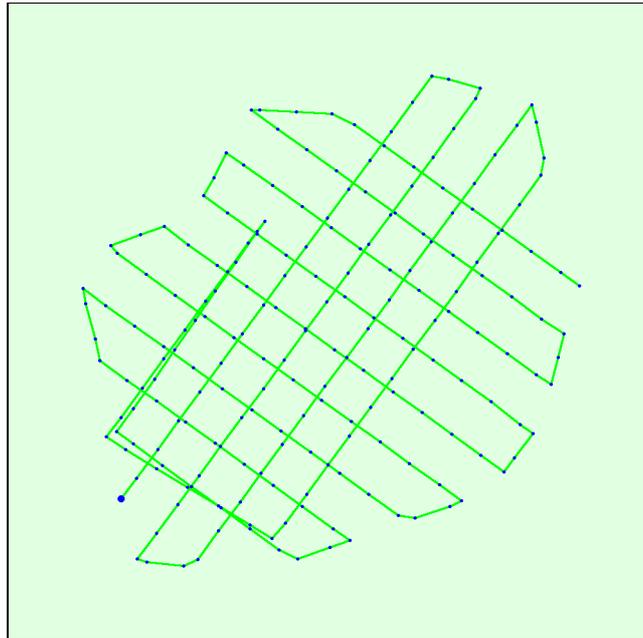
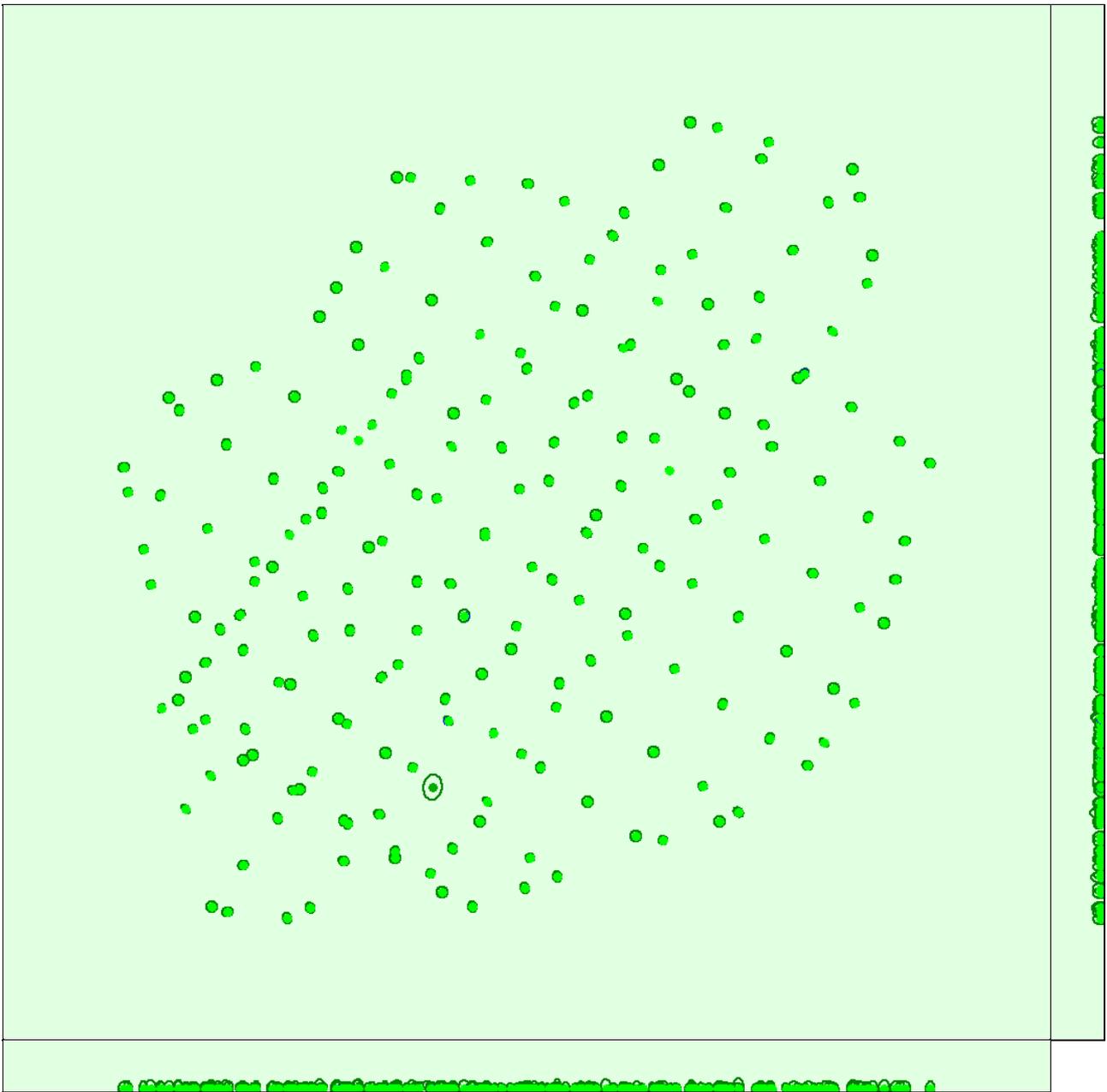


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

? 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	0.002	0.002	0.002	0.001	0.001	0.001
Sigma	0.000	0.000	0.000	0.000	0.000	0.000

? Overlap



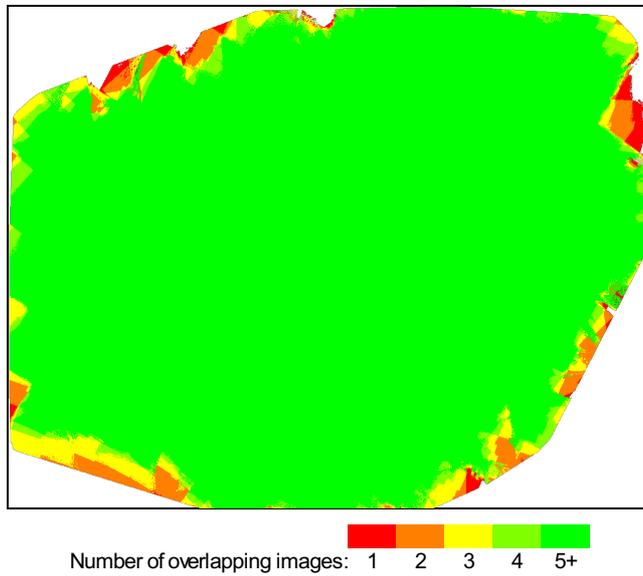


Figure 4: Number of overlapping images computed for each pixel of the orthomosaic. Red and yellow areas indicate low overlap for which poor results may be generated. Green areas indicate an overlap of over 5 images for every pixel. Good quality results will be generated as long as the number of keypoint matches is also sufficient for these areas (see Figure 5 for keypoint matches).

Bundle Block Adjustment Details

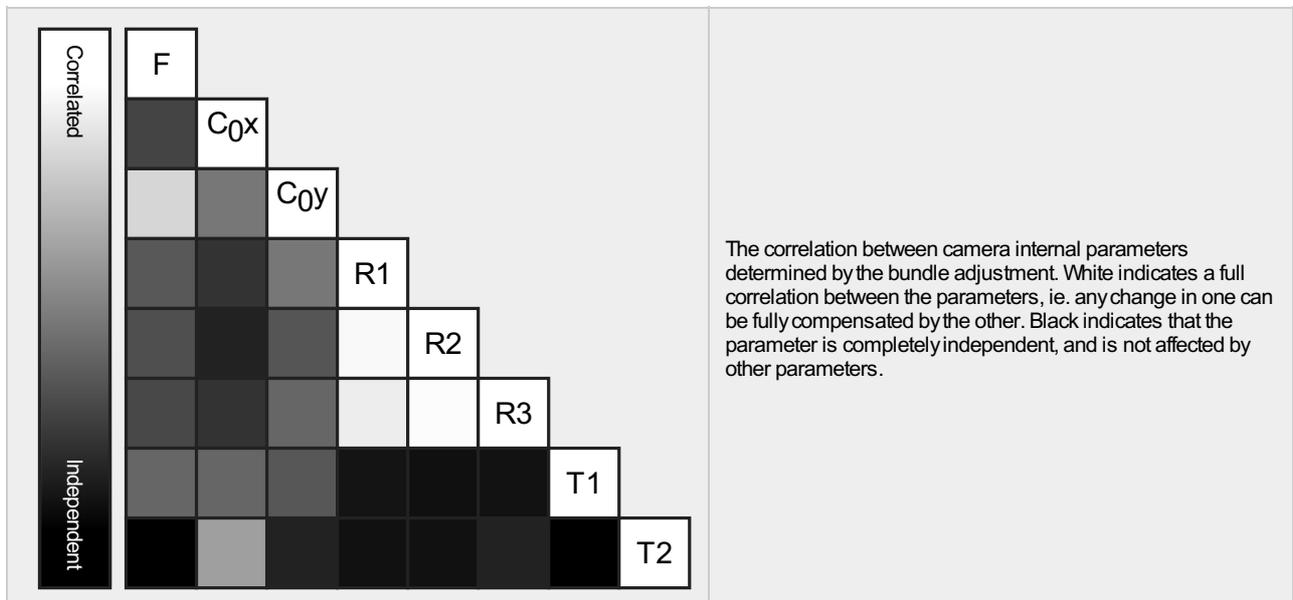
Number of 2D Keypoint Observations for Bundle Block Adjustment	3464231
Number of 3D Points for Bundle Block Adjustment	1136730
Mean Reprojection Error [pixels]	0.152

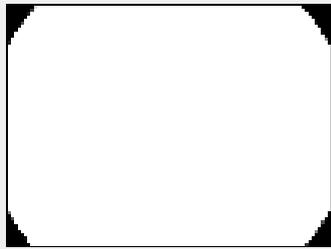
Internal Camera Parameters

FC6310R_8.8_4864x3648 (RGB). Sensor Dimensions: 11.407 [mm] x 8.556 [mm]

EXIF ID: FC6310R_8.8_4864x3648

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	3666.840 [pixel] 8.600 [mm]	2420.300 [pixel] 5.676 [mm]	1835.990 [pixel] 4.306 [mm]	-0.270	0.112	-0.032	0.000	-0.001
Optimized Values	3650.162 [pixel] 8.561 [mm]	2422.417 [pixel] 5.681 [mm]	1847.677 [pixel] 4.333 [mm]	-0.269	0.115	-0.036	0.001	0.000
Uncertainties (Sigma)	0.059 [pixel] 0.000 [mm]	0.047 [pixel] 0.000 [mm]	0.075 [pixel] 0.000 [mm]	0.000	0.000	0.000	0.000	0.000





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	51009	17134
Min	32509	1482
Max	69030	29675
Mean	51195	16735

3D Points from 2D Keypoint Matches



	Number of 3D Points Observed
In 2 Images	718485
In 3 Images	189170
In 4 Images	84594
In 5 Images	46704
In 6 Images	28530
In 7 Images	18605
In 8 Images	12637
In 9 Images	8927
In 10 Images	6596
In 11 Images	4833
In 12 Images	3689
In 13 Images	2799
In 14 Images	2222
In 15 Images	1761
In 16 Images	1349
In 17 Images	1065
In 18 Images	850
In 19 Images	713
In 20 Images	559
In 21 Images	457
In 22 Images	382
In 23 Images	322
In 24 Images	254
In 25 Images	209
In 26 Images	169
In 27 Images	144
In 28 Images	128
In 29 Images	92
In 30 Images	77
In 31 Images	69
In 32 Images	59
In 33 Images	49
In 34 Images	50
In 35 Images	23
In 36 Images	30
In 37 Images	28
In 38 Images	20
In 39 Images	14
In 40 Images	14

In 41 Images	11
In 42 Images	13
In 43 Images	7
In 44 Images	7
In 45 Images	3
In 46 Images	2
In 47 Images	2
In 48 Images	4
In 53 Images	2
In 56 Images	1

2D Keypoint Matches

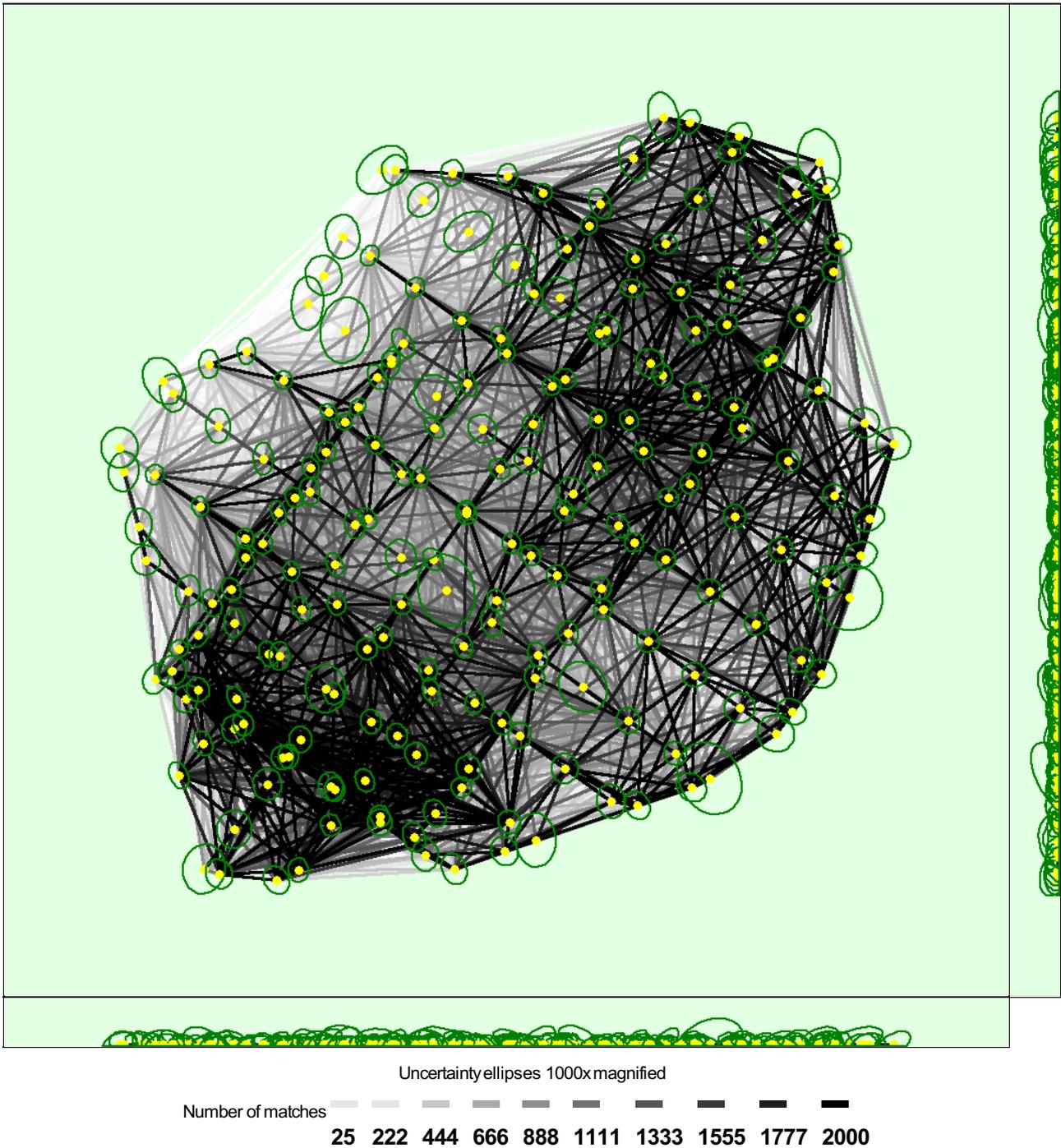


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty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

Geolocation Details

? Absolute Geolocation Variance

Mn Error [m]	Max Error [m]	Geolocation Error X[%]	Geolocation Error Y[%]	Geolocation Error Z[%]
-	-0.03	0.00	0.00	0.49
-0.03	-0.03	0.00	0.00	0.00
-0.03	-0.02	0.00	0.00	0.49
-0.02	-0.01	0.00	0.00	3.40
-0.01	-0.01	0.97	0.97	18.45
-0.01	0.00	52.43	41.75	40.29
0.00	0.01	44.66	57.28	26.70
0.01	0.01	0.97	0.00	5.83
0.01	0.02	0.97	0.00	0.49
0.02	0.03	0.00	0.00	0.49
0.03	0.03	0.00	0.00	0.97
0.03	-	0.00	0.00	2.43
Mean [m]		0.000031	-0.000001	0.000209
Sigma [m]		0.003038	0.002073	0.018985
RMS Error [m]		0.003038	0.002073	0.018986

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]	98.54	99.03	95.15
[-2.00, 2.00]	100.00	100.00	97.57
[-3.00, 3.00]	100.00	100.00	98.54
Mean of Geolocation Accuracy [m]	0.009470	0.009470	0.021507
Sigma of Geolocation Accuracy [m]	0.000325	0.000325	0.000523

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

Geolocation Orientational Variance	RMS [degree]
Omega	0.906
Phi	0.945
Kappa	2.135

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) Xeon(R) CPU E3-1505Mv5 @ 2.80GHz RAM: 32GB GPU: Intel(R) HD Graphics P530 (Driver: 23.20.16.4973)
Operating System	Windows 10 Pro, 64-bit

Coordinate Systems



Image Coordinate System	WGS 84
Output Coordinate System	TWD97 / TM2 zone 121

Processing Options



Detected Template	DJI P4 RTK*
Keypoints Image Scale	Full, Image Scale: 1
Advanced: Matching Image Pairs	Aerial Grid or Corridor
Advanced: Matching Strategy	Use Geometrically Verified Matching: yes
Advanced: Keypoint Extraction	Targeted Number of Keypoints: Automatic
Advanced: Calibration	Calibration Method: Geolocation Based Internal Parameters Optimization: All External Parameters Optimization: All Rematch: Auto, yes

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: yes
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	02h:15m:57s
Time for Point Cloud Classification	13m:24s
Time for 3D Textured Mesh Generation	36m:56s

Results



Number of Generated Tiles	1
Number of 3D Densified Points	18282865
Average Density (per m ³)	81.42

DSM, Orthomosaic and Index Details



Processing Options



DSM and Orthomosaic Resolution	1 x GSD (3.44 [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: yes
Raster DTM	Generated: yes Merge Tiles: yes
DTMResolution	10 x GSD (3.44 [cm/pixel])
Time for DSM Generation	19m:41s
Time for Orthomosaic Generation	44m:32s
Time for DTM Generation	01m:16s
Time for Contour Lines Generation	00s
Time for Reflectance Map Generation	00s
Time for Index Map Generation	00s