Quality Report



Generated with Pix4Denterprise version 4.3.27



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

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Project	sier_3k_1_x3
Processed	2018-10-04 06:50:18
Camera Model Name(s)	FC350_3.6_4000x3000 (RGB)
Average Ground Sampling Distance (GSD)	4.91 cm / 1.93 in
Area Covered	0.634 km ² / 63.4026 ha / 0.24 sq. mi. / 156.7523 acres
Time for Initial Processing (without report)	37m:54s

Quality Check

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Images	median of 12505 keypoints per image	O
? Dataset	2008 out of 2017 images calibrated (99%), all images enabled	②
? Camera Optimization	0.76% relative difference between initial and optimized internal camera parameters	②
Matching	median of 952.649 matches per calibrated image	<u> </u>
Georeferencing	yes, no 3D GCP	<u> </u>





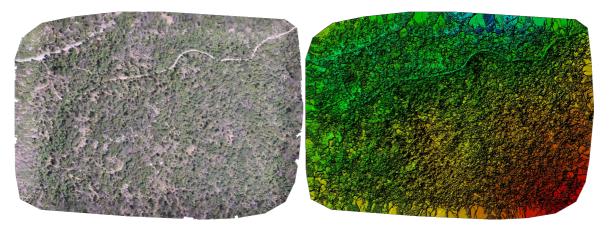


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

Calibration Details



Number of Calibrated Images	2008 out of 2017
Number of Geolocated Images	2017 out of 2017



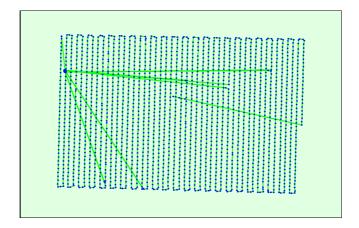
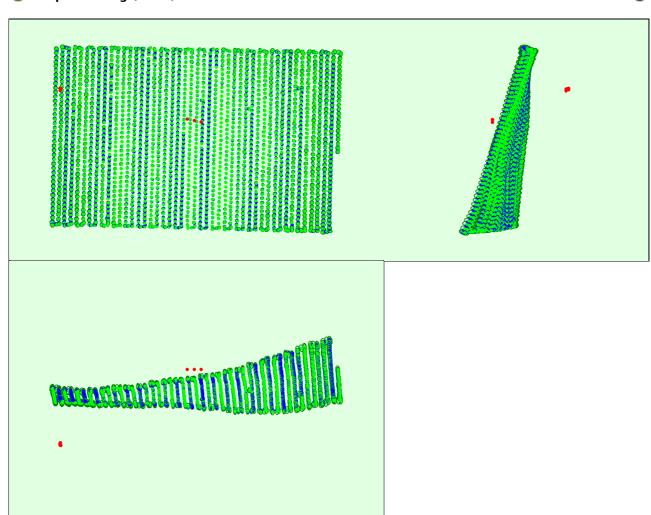


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

? Computed Image/GCPs/Manual Tie Points Positions



Uncertainty ellipses 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.

Absolute camera position and orientation uncertainties

	X [m]	Y [m]	Z [m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.083	0.083	0.155	0.032	0.029	0.013

Sigma	0.014	0.014	0.025	0.002	0.005	0.001





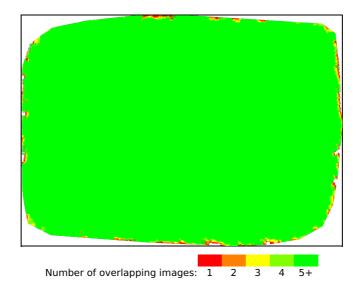


Figure 4: Number of overlapping images computed for each pixel of the orthomosaic.

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	2134392
Number of 3D Points for Bundle Block Adjustment	784322
Mean Reprojection Error [pixels]	0.130

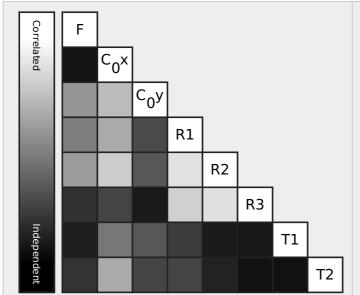
Internal Camera Parameters

⊖ FC350_3.6_4000x3000 (RGB). Sensor Dimensions: 6.317 [mm] x 4.738 [mm]

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EXIF ID: FC350_3.6_4000x3000

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	2285.722 [pixel] 3.610 [mm]	2000.006 [pixel] 3.159 [mm]	1500.003 [pixel] 2.369 [mm]	-0.130	0.106	-0.016	-0.000	0.000
Optimized Values	2303.229 [pixel] 3.638 [mm]	1985.575 [pixel] 3.136 [mm]	1503.840 [pixel] 2.375 [mm]	-0.127	0.109	-0.014	0.001	0.000
Uncertainties (Sigma)	0.776 [pixel] 0.001 [mm]	0.045 [pixel] 0.000 [mm]	0.049 [pixel] 0.000 [mm]	0.000	0.000	0.000	0.000	0.000



The correlation between camera internal parameters determined by the bundle adjustment. White indicates a full correlation between the parameters, ie. any change in one can be fully compensated by the other. Black indicates that the parameter is completely independent, and is not affected by other 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 the 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

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	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	12505	953
Min	11604	433
Max	13657	2796
Mean	12469	1063

3D Points from 2D Keypoint Matches

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	Number of 3D Points Observed
In 2 Images	555736
In 3 Images	121336
In 4 Images	45954
In 5 Images	22160
In 6 Images	12223
In 7 Images	7466
In 8 Images	4890
In 9 Images	3212
In 10 Images	2352
In 11 Images	1760
In 12 Images	1341
In 13 Images	1032
In 14 Images	856
In 15 Images	618
In 16 Images	514
In 17 Images	407
In 18 Images	339
In 19 Images	298
In 20 Images	249
In 21 Images	205
In 22 Images	185

In 23 Images	160
In 24 Images	116
In 25 Images	106
In 26 Images	97
In 27 Images	84
In 28 Images	69
In 29 Images	50
In 30 Images	63
In 31 Images	59
In 32 Images	46
In 33 Images	30
In 34 Images	21
In 35 Images	36
In 36 Images	22
In 37 Images	30
In 38 Images	19
In 39 Images	12
In 40 Images	17
In 41 Images	15
	12
In 42 Images	
In 44 Images	10
In 44 Images	19
In 45 Images	9
In 46 Images	6
In 47 Images	11
In 48 Images	5
In 49 Images	12
In 50 Images	4
In 51 Images	1
In 52 Images	6
In 53 Images	5
In 54 Images	3
In 55 Images	3
In 56 Images	4
In 57 Images	5
In 58 Images	2
In 59 Images	3
In 61 Images	1
In 62 Images	2
In 63 Images	1
In 64 Images	2
In 65 Images	1
In 68 Images	2
In 69 Images	2
In 74 Images	2
In 75 Images	1
In 81 Images	2
In 83 Images	1

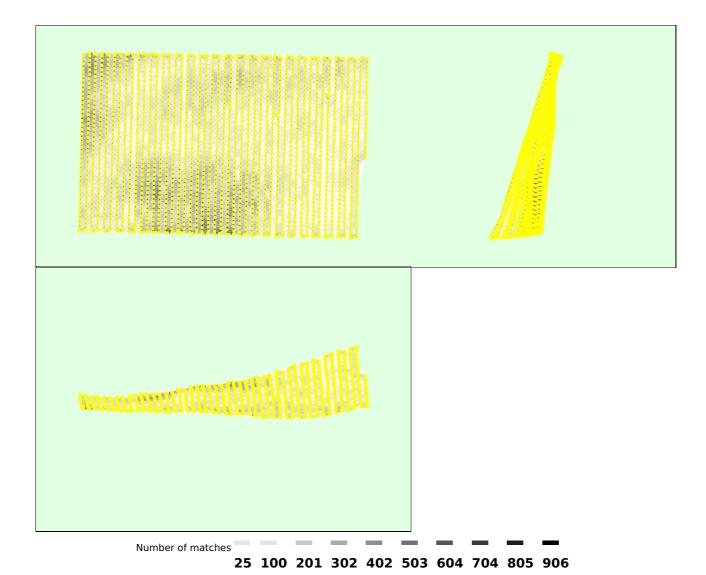


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images.

Geolocation Details ② Absolute Geolocation Variance

Min Error [m]	Max Error [m]	Geolocation Error X [%]	Geolocation Error Y [%]	Geolocation Error Z [%]
-	-15.00	0.00	0.00	0.00
-15.00	-12.00	0.00	0.00	0.00
-12.00	-9.00	0.00	0.00	0.00
-9.00	-6.00	0.00	0.05	0.00
-6.00	-3.00	0.65	14.69	0.75
-3.00	0.00	42.93	36.25	51.94
0.00	3.00	56.42	33.07	44.92
3.00	6.00	0.00	15.94	2.39
6.00	9.00	0.00	0.00	0.00
9.00	12.00	0.00	0.00	0.00
12.00	15.00	0.00	0.00	0.00
15.00	-	0.00	0.00	0.00
Mean [m]		-0.000000	0.000000	0.000000
Sigma [m]		0.574921	2.640379	1.448383
RMS Error [m]		0.574921	2.640379	1.448383

? Relative Geolocation Variance

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Relative Geolocation Error	Images X [%]	Images Y [%]	Images Z [%]
[-1.00, 1.00]	99.95	97.01	100.00
[-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]	5.000000	5.000000	10.000000
Sigma of Geolocation Accuracy [m]	0.000000	0.000000	0.000000

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

Geolocation Orientational Variance	RMS [degree]
Omega	0.940
Phi	0.909
Карра	5.260

Geolocation RMS error of the orientation angles given by the difference between the initial and computed image orientation angles.

Initial Processing Details

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System Information

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Hardware	CPU: Intel(R) Xeon(R) Platinum 8124M CPU @ 3.00GHz RAM: 69GB GPU: no info (Driver: unknown)
Operating System	Linux 4.15.0-1021-aws x86_64

Coordinate Systems



Image Coordinate System	WGS 84 (EGM 96 Geoid)
Output Coordinate System	WGS 84 / UTM zone 11N (EGM 96 Geoid)

Processing Options



Detected Template	No Template Available
Keypoints Image Scale	Custom, 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	02h:34m:53s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	52m:36s

Results

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Number of Generated Tiles	6
Number of 3D Densified Points	82814502
Average Density (per m ³)	24.8

DSM, Orthomosaic and Index Details

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Processing Options

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DSM and Orthomosaic Resolution	1 x GSD (4.91 [cm/pixel])
DSM Filters	Noise Filtering: yes Surface Smoothing: yes, Type: Sharp
Raster DSM	Generated: yes Method: Triangulation Merge Tiles: yes
Orthomosaic	Generated: yes Merge Tiles: yes GeoTIFF Without Transparency: no Google Maps Tiles and KML: no
Time for DSM Generation	07m:39s
Time for Orthomosaic Generation	06h:17m:23s
Time for DTM Generation	00s
Time for Contour Lines Generation	00s
Time for Reflectance Map Generation	00s
Time for Index Map Generation	00s