

Quality Report



Generated with Pix4Dmapper version 4.3.33



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	Nesjenvær
Processed	2019-03-22 18:35:48
Camera Model Name(s)	FC330_3.6_4000x3000 (RGB)
Average Ground Sampling Distance (GSD)	1.38 cm / 0.54 in
Time for Initial Processing (without report)	01h:56m:57s

Quality Check



Images	median of 48636 keypoints per image	
Dataset	225 out of 226 images calibrated (99%), all images enabled, 3 blocks	
Camera Optimization	4.78% relative difference between initial and optimized internal camera parameters	
Matching	median of 21220.5 matches per calibrated image	
Georeferencing	yes, no 3D GCP	

Calibration Details



Number of Calibrated Images	225 out of 226
Number of Geolocated Images	226 out of 226



Initial Image Positions



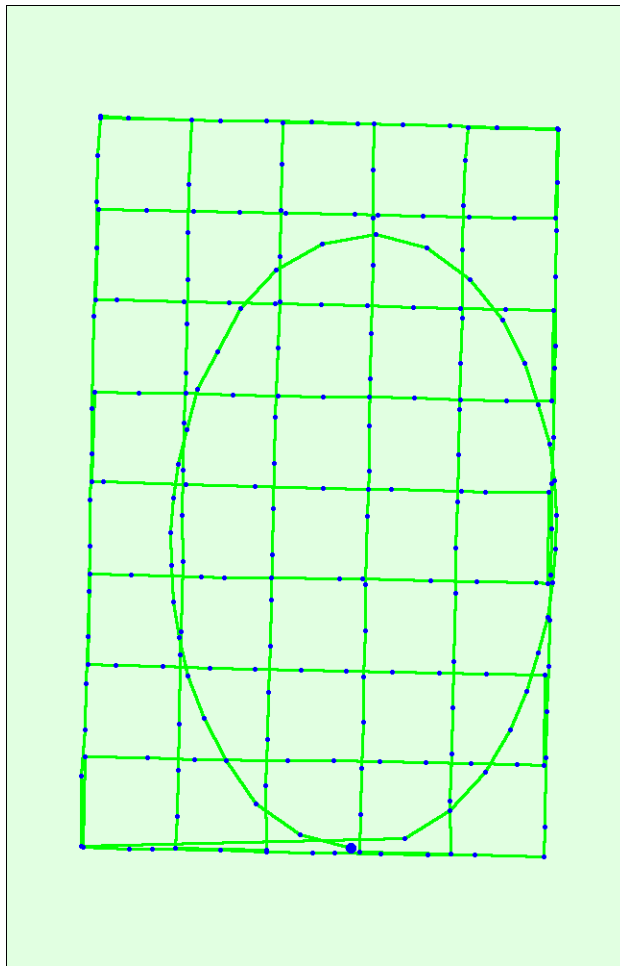
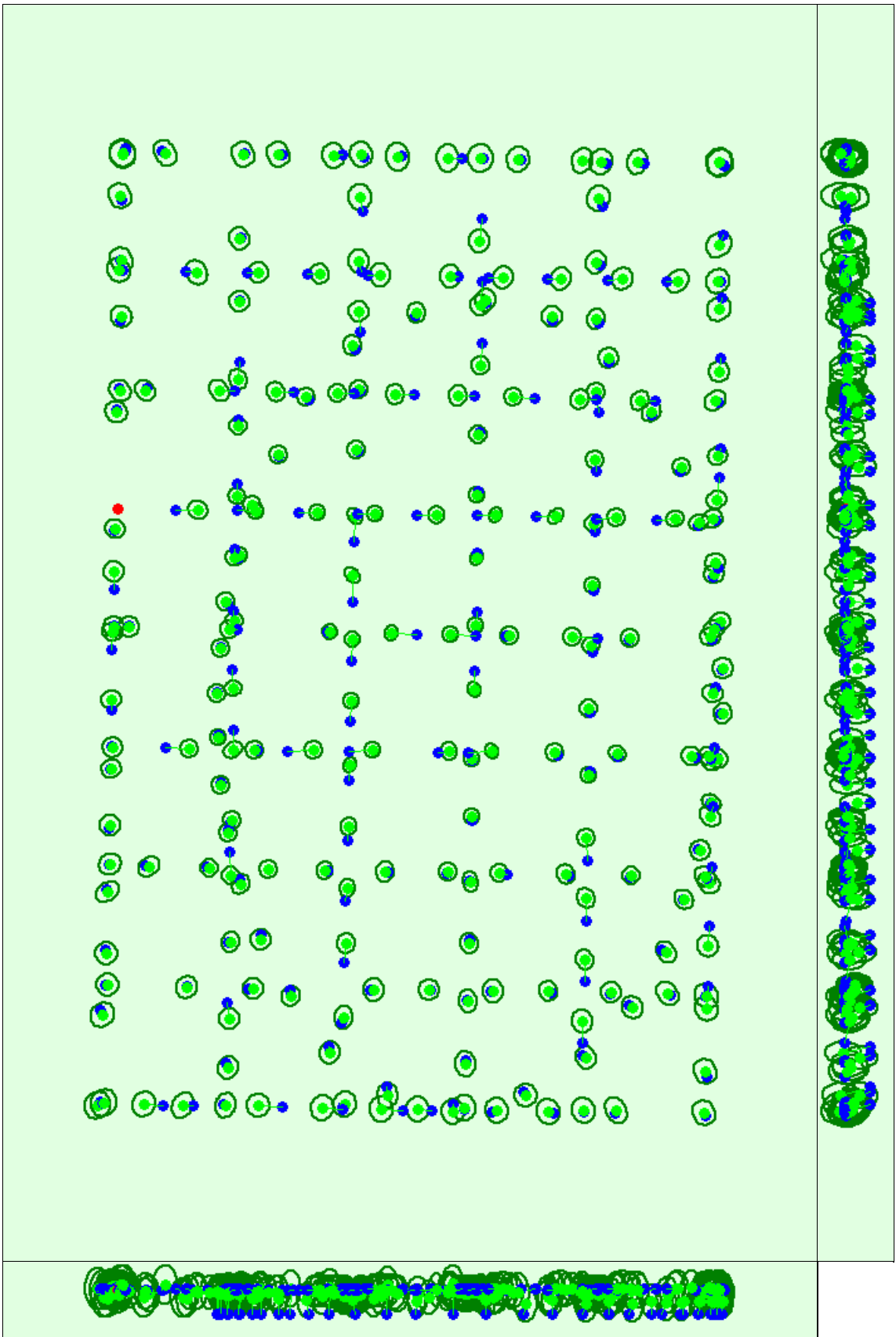


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.



Uncertainty ellipses 10x 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	0.203	0.210	0.338	0.110	0.116	0.116

Sigma	0.027	0.035	0.017	0.012	0.008	0.018
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Bundle Block Adjustment Details



Number of 2D Keypoint Observations for Bundle Block Adjustment	4765765
Number of 3D Points for Bundle Block Adjustment	1766977
Mean Reprojection Error [pixels]	0.276

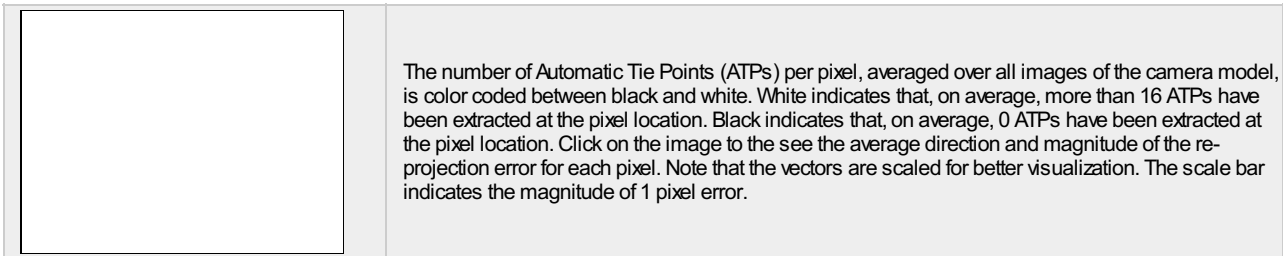
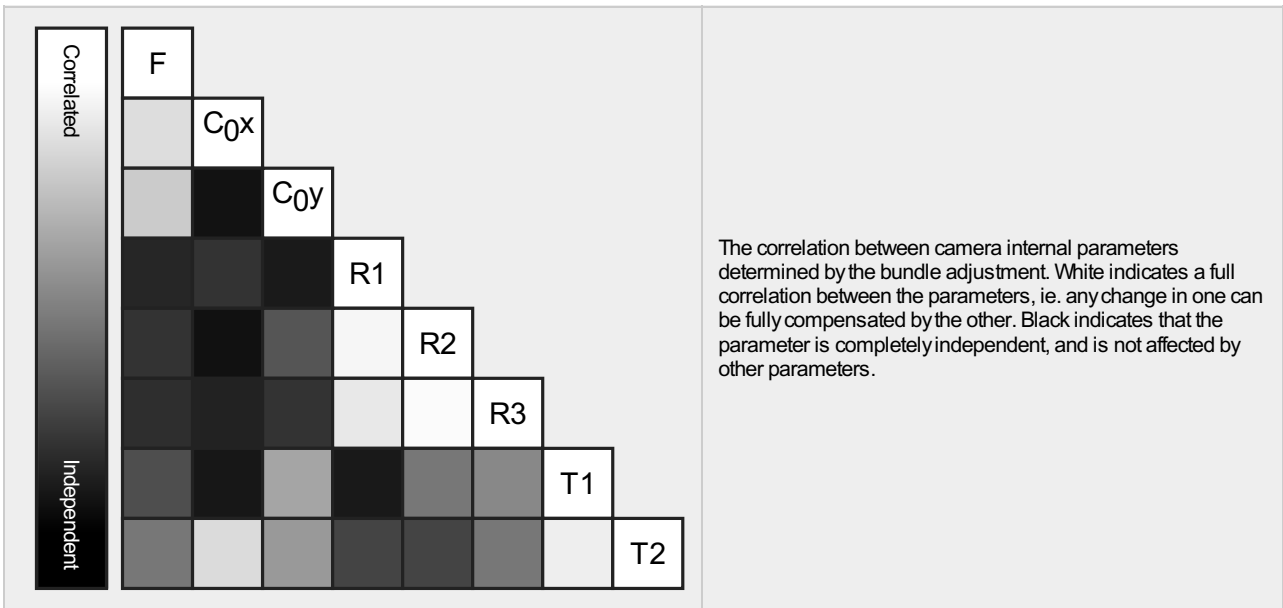
Internal Camera Parameters

FC330_3.6_4000x3000 (RGB). Sensor Dimensions: 6.317 [mm] x 4.738 [mm]



EXIF ID: FC330_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]	-0.001	-0.002	0.000	-0.001	-0.001
Optimized Values	2395.155 [pixel] 3.783 [mm]	2070.560 [pixel] 3.270 [mm]	1495.257 [pixel] 2.362 [mm]	-0.002	-0.006	0.004	0.000	0.001
Uncertainties (Sigma)	0.156 [pixel] 0.000 [mm]	0.074 [pixel] 0.000 [mm]	0.119 [pixel] 0.000 [mm]	0.000	0.000	0.000	0.000	0.000



2D Keypoints Table



	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	48636	21220
Min	27618	424
Max	69781	38821
Mean	48995	21181

🔍 3D Points from 2D Keypoint Matches



	Number of 3D Points Observed
In 2 Images	1188506
In 3 Images	316989
In 4 Images	124515
In 5 Images	55982
In 6 Images	29678
In 7 Images	17153
In 8 Images	10585
In 9 Images	7016
In 10 Images	4590
In 11 Images	3113
In 12 Images	2199
In 13 Images	1596
In 14 Images	1188
In 15 Images	942
In 16 Images	630
In 17 Images	564
In 18 Images	403
In 19 Images	321
In 20 Images	248
In 21 Images	194
In 22 Images	165
In 23 Images	96
In 24 Images	90
In 25 Images	69
In 26 Images	48
In 27 Images	31
In 28 Images	24
In 29 Images	22
In 30 Images	6
In 31 Images	5
In 32 Images	3
In 33 Images	3
In 34 Images	1
In 35 Images	1
In 40 Images	1

🔍 2D Keypoint Matches



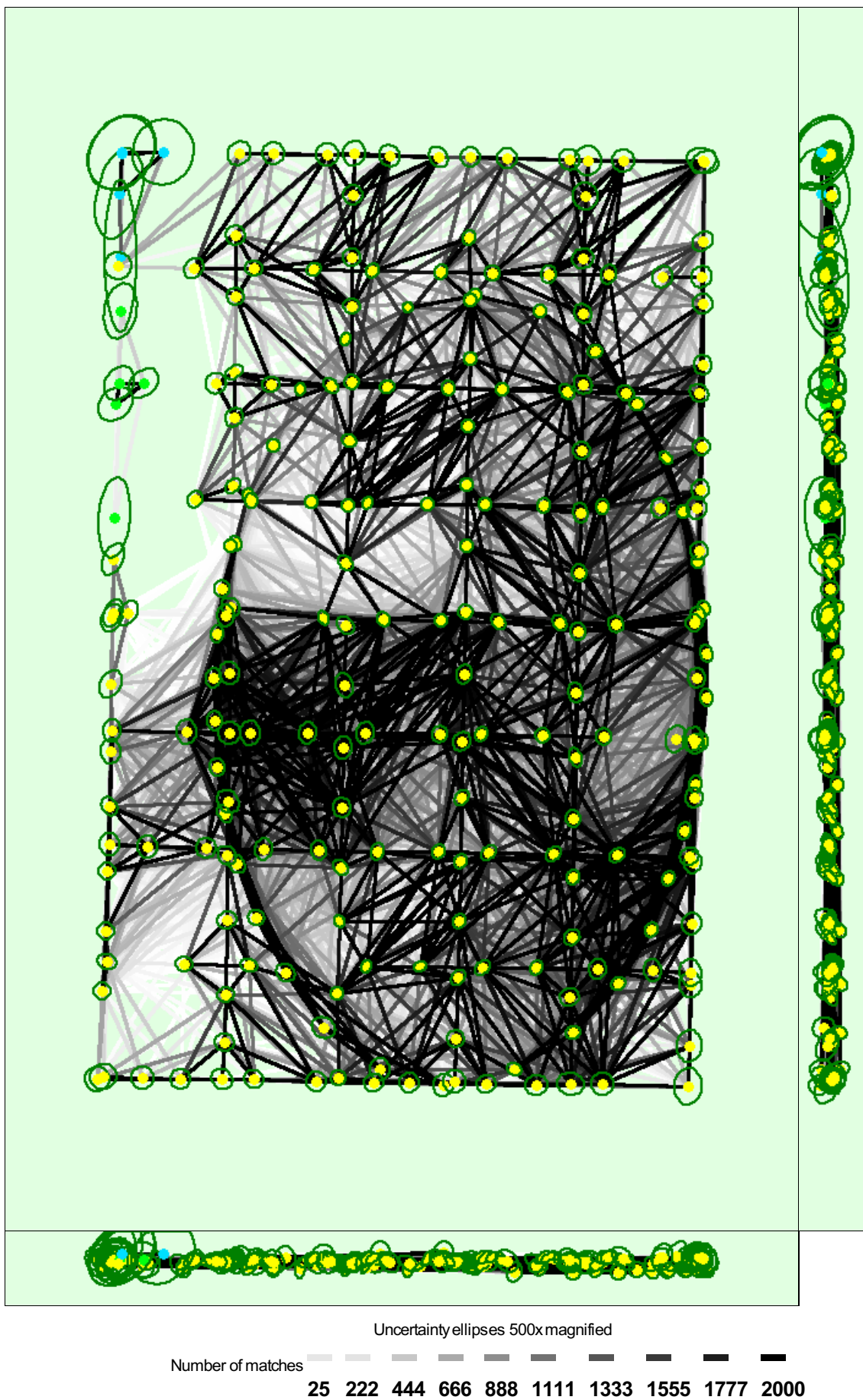


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty of the bundle block adjustment result.

	X[m]	Y[m]	Z[m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.004	0.004	0.004	0.008	0.007	0.006
Sigma	0.002	0.003	0.002	0.004	0.003	0.005

Geolocation Details

? Absolute Geolocation Variance

Mn 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	0.00	0.44
-6.00	-3.00	6.67	6.22	5.78
-3.00	0.00	43.56	50.22	21.33
0.00	3.00	43.11	37.78	72.44
3.00	6.00	6.67	5.78	0.00
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]		0.007735	0.005245	-0.016183
Sigma [m]		1.622203	1.628341	1.570363
RMS Error [m]		1.622221	1.628349	1.570447

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]	98.22	99.56	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	2.149
Phi	4.330
Kappa	7.122

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) i7-2600 CPU @ 3.40GHz RAM: 8GB GPU: AMD Radeon HD 5450 (Driver: 15.201.1151.1008)
Operating System	Windows 10 Education, 64-bit

Coordinate Systems

Image Coordinate System	WGS 84 (EGM96 Geoid)
Output Coordinate System	WGS 84 / UTM zone 32N (EGM96 Geoid)

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	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	01h:02m:21s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	09m:35s

Results

Number of Processed Clusters	4
Number of Generated Tiles	1
Number of 3D Densified Points	16632197
Average Density (per m ³)	813.13

DSM, Orthomosaic and Index Details

Processing Options

DSM and Orthomosaic Resolution	1 x GSD (1.38 [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	21m:31s
Time for Orthomosaic Generation	01h:04m:55s
Time for DTM Generation	00s
Time for Contour Lines Generation	00s
Time for Reflectance Map Generation	00s
Time for Index Map Generation	00s