Quality Report

Generated with Pix4Dmapper Pro version 3.1.22

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	
Processed	2017-01-30 16:00:22
Camera Model Name(s)	FC300S_3.6_4000x3000 (RGB)
Average Ground Sampling Distance (GSD)	2.32 cm / 0.91 in
Time for Initial Processing (without report)	01h:12m:13s

Quality Check

Images	median of 2607 keypoints per image	✓
Dataset	802 out of 814 images calibrated (98%), all images enabled, 5 blocks	⚠
Camera Optimization	1.62% relative difference between initial and optimized internal camera parameters	✓
Matching	median of 648.115 matches per calibrated image	✓
Georeferencing	yes, no 3D GCP	⚠

Calibration Details

Number of Calibrated Images	802 out of 814
Number of Geolocated Images	814 out of 814

Initial Image Positions

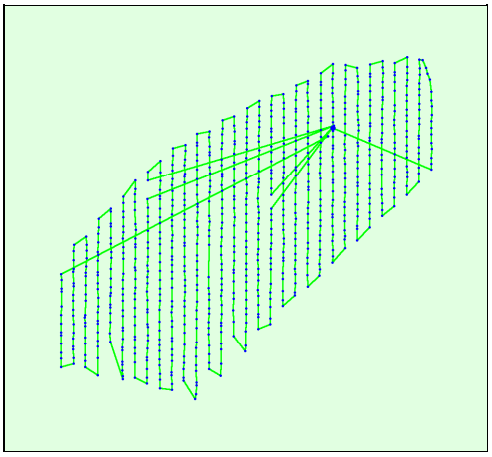
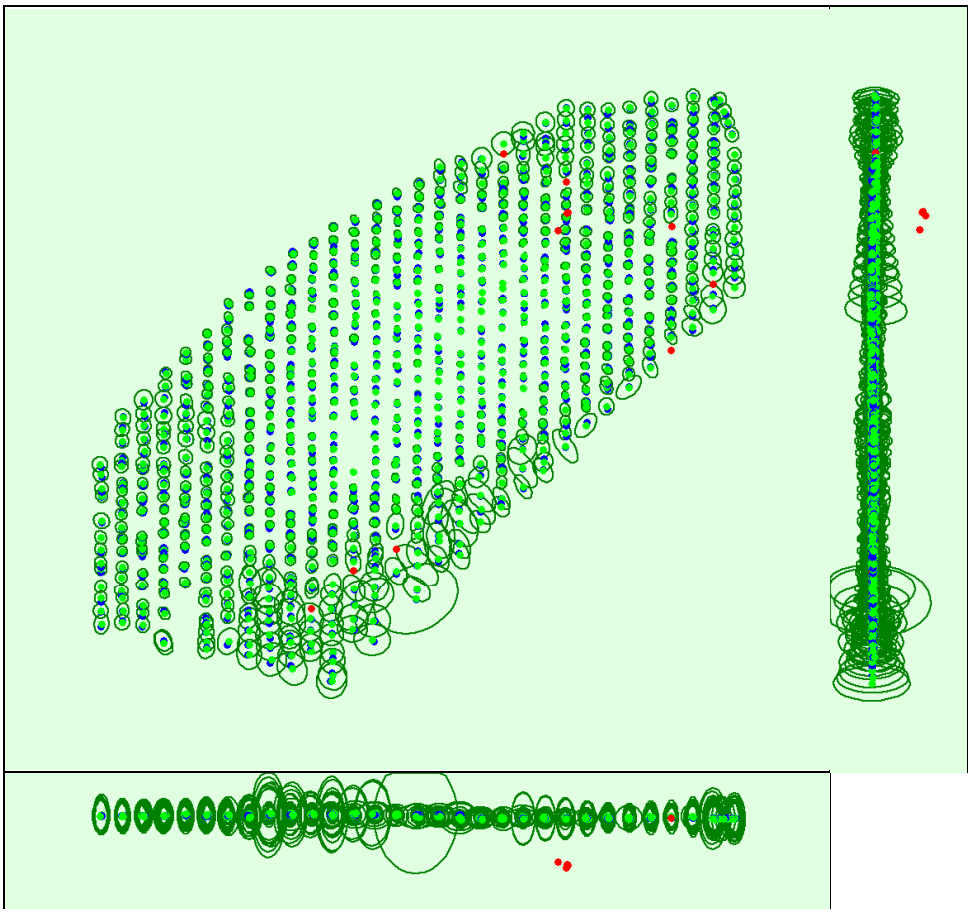


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

Computed Image/GCPs/Manual Tie Points Positions



Uncertainty ellipses 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 [ft]	Y [ft]	Z [ft]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	1.691	1.819	3.061	0.773	0.711	0.236
Sigma	0.972	1.078	1.653	0.746	0.534	0.228

Bundle Block Adjustment Details

Number of 2D Keypoint Observations for Bundle Block Adjustment	497303
Number of 3D Points for Bundle Block Adjustment	127820
Mean Reprojection Error [pixels]	0.115

Internal Camera Parameters

FC300S_3.6_4000x3000 (RGB). Sensor Dimensions: 6.317 [mm] x 4.738 [mm]

EXIF ID: FC300S_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]	-0.132	0.111	-0.016	0.000	0.000
Optimized Values	2322.866 [pixel] 3.669 [mm]	1997.654 [pixel] 3.155 [mm]	1476.756 [pixel] 2.332 [mm]	-0.001	-0.015	0.031	-0.001	0.000
Uncertainties (Sigma)	1.385 [pixel] 0.002 [mm]	1.584 [pixel] 0.003 [mm]	1.541 [pixel] 0.002 [mm]	0.002	0.006	0.005	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 the see the average direction and magnitude of the re-projection error for each pixel. Note that the vectors are scaled for better visualization.

2D Keypoints Table

	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	2607	648
Min	1940	22
Max	3546	1238
Mean	2653	620

3D Points from 2D Keypoint Matches

	Number of 3D Points Observed
In 2 Images	52051
In 3 Images	26283
In 4 Images	15917
In 5 Images	9870
In 6 Images	6779
In 7 Images	4630
In 8 Images	3461
In 9 Images	2499
In 10 Images	1855
In 11 Images	1364
In 12 Images	950
In 13 Images	655
In 14 Images	432
In 15 Images	313
In 16 Images	233
In 17 Images	147
In 18 Images	106
In 19 Images	84
In 20 Images	67
In 21 Images	46
In 22 Images	35
In 23 Images	10
In 24 Images	20
In 25 Images	6
In 26 Images	3
In 27 Images	2
In 30 Images	2

2D Keypoint Matches

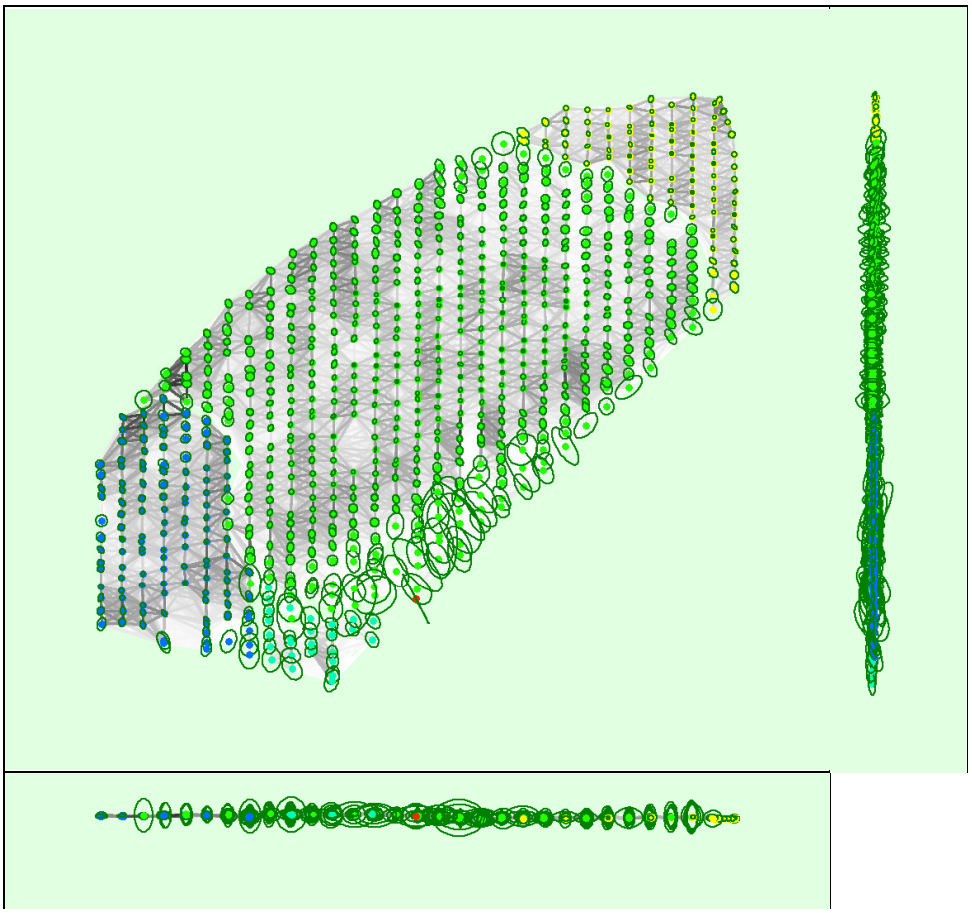


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty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

Relative camera position and orientation uncertainties

	X [ft]	Y [ft]	Z [ft]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	1.184	1.375	1.327	0.503	0.475	0.150
Sigma	0.880	1.185	0.883	0.363	0.337	0.135

Geolocation Details

Absolute Geolocation Variance

Min Error [ft]	Max Error [ft]	Geolocation Error X [%]	Geolocation Error Y [%]	Geolocation Error Z [%]
-	-15.00	0.00	0.12	0.00
-15.00	-12.00	0.00	1.25	0.00
-12.00	-9.00	0.00	8.48	0.00
-9.00	-6.00	0.00	11.10	0.00
-6.00	-3.00	1.50	10.72	9.23
-3.00	0.00	46.13	18.08	42.27
0.00	3.00	51.62	17.71	39.15
3.00	6.00	0.75	12.59	6.86
6.00	9.00	0.00	10.60	2.37
9.00	12.00	0.00	7.98	0.12
12.00	15.00	0.00	1.37	0.00
15.00	-	0.00	0.00	0.00
Mean [ft]		-0.000000	0.000000	0.000000
Sigma [ft]		1.111616	6.352320	2.433020
RMS Error [ft]		1.111616	6.352320	2.433020

Min Error and Max Error represent geolocation error intervalsbetween -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 intial 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]	99.63	52.74	100.00
[-2.00, 2.00]	100.00	87.16	100.00
[-3.00, 3.00]	100.00	99.88	100.00
Mean of Geolocation Accuracy [ft]	5.000000	5.000000	10.000000
Sigma of Geolocation Accuracy [ft]	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	0.738
Phi	1.434
Kappa	5.608

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) i7-3610QM CPU @ 2.30GHz RAM: 28GB GPU: NVIDIA Quadro K3000M (Driver: 10.18.13.5442), RDPDD Chained DD (Driver: unknown), RDP Encoder Mirror Driver (Driver: unknown), RDP Reflector Display Driver (Driver: unknown)
Operating System	Windows 7 Professional, 64-bit

Coordinate Systems

Image Coordinate System	WGS84 (egm96)
Output Coordinate System	NAD_1983_StatePlane_Kentucky_North_FIPS_1601_Feet (egm96)

Processing Options

Detected Template	No Template Available
Keypoints Image Scale	Rapid, Image Scale: 0.25
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: Alternative Internal Parameters Optimization: All External Parameters Optimization: All Rematch: Auto, no Bundle Adjustment: Classic