

Quality Report



Generated with PIX4Dmapper version 4.8.4



Important: Click on the different icons for:



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Additional information about the sections



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Summary



Project	240109_SouthCord
Processed	2024-04-03 17:44:50
Camera Model Name(s)	FC6520_DJIMFT15mmF1.7ASPH_15.0_5280x3956 (RGB)(1)
Average Ground Sampling Distance (GSD)	0.73 cm / 0.29 in
Area Covered	0.076 km ² / 7.5661 ha / 0.03 sq. mi. / 18.7060 acres
Time for Initial Processing (without report)	16m:28s

Quality Check



Images	median of 4418 keypoints per image	
Dataset	522 out of 525 images calibrated (99%), all images enabled, 2 blocks	
Camera Optimization	19.47% relative difference between initial and optimized internal camera parameters	
Matching	median of 1078.09 matches per calibrated image	
Georeferencing	yes, no 3D GCP	

Preview

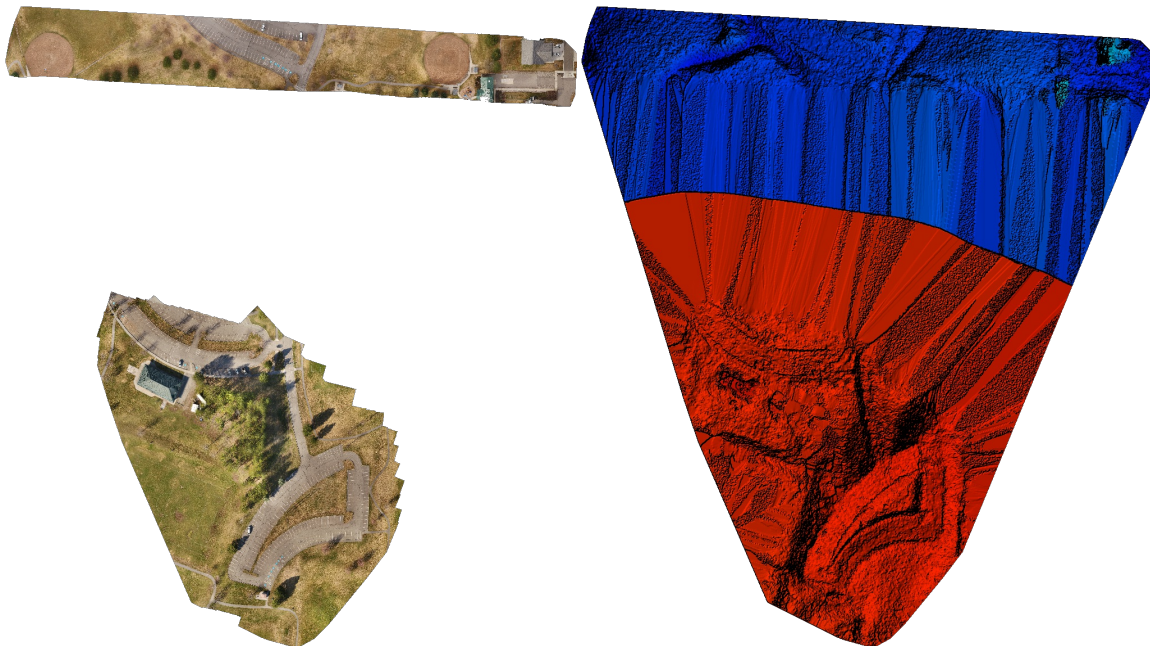


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

Calibration Details



Number of Calibrated Images	522 out of 525
Number of Geolocated Images	525 out of 525

? Initial Image Positions

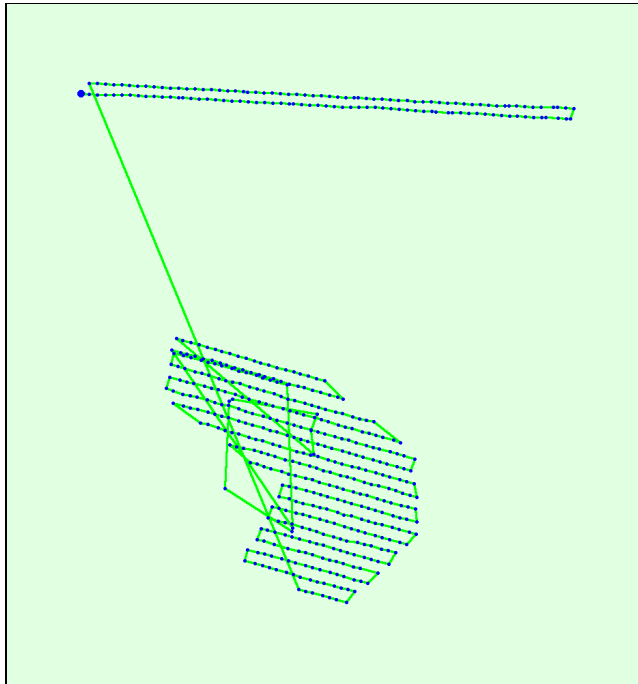
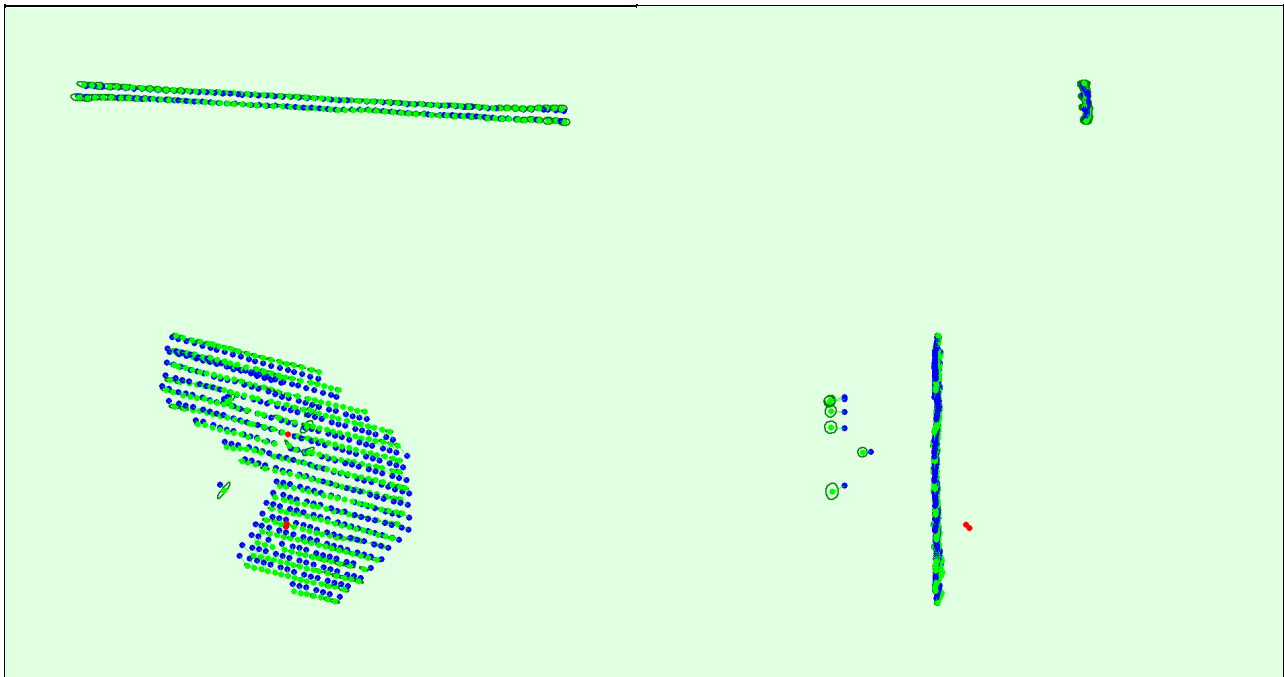
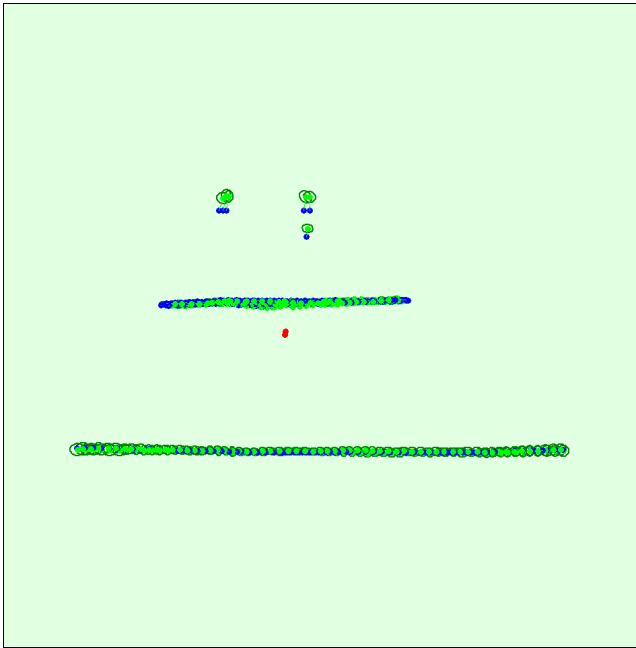


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

? 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[US survey foot]	Y[US survey foot]	Z[US survey foot]	Omega [degree]	Phi [degree]	Kappa [degree]	Camera Displacement X[US survey foot]	Camera Displacement Y[US survey foot]	Camera Displacement Z[US survey foot]
Mean	0.951	0.536	0.823	0.110	0.326	0.079	0.097	0.063	0.307
Sigma	0.386	0.206	0.313	0.035	0.145	0.030	0.057	0.036	0.153

? Overlap

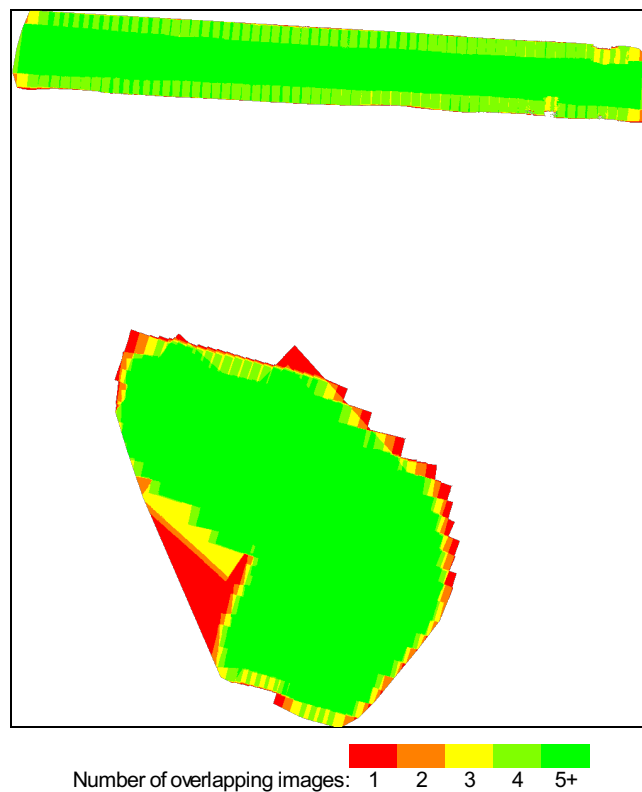


Figure 4: Number of overlapping images computed for each pixel of the orthomosaic. Red and yellow areas indicate low overlap for which poor results may be generated. Green areas indicate an overlap of over 5 images for every pixel. Good

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	626406
Number of 3D Points for Bundle Block Adjustment	183493
Mean Reprojection Error [pixels]	0.160

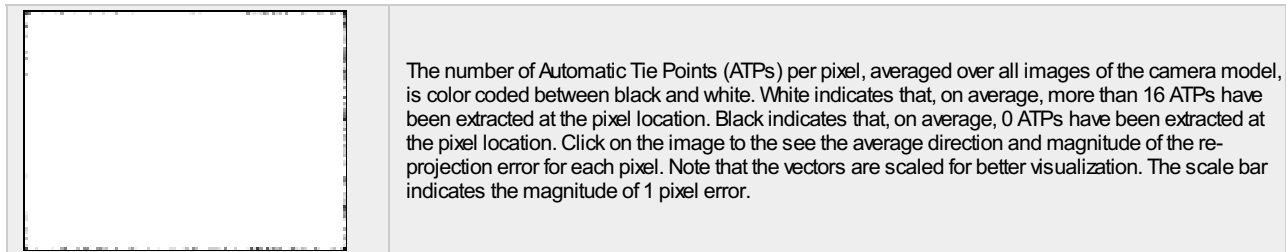
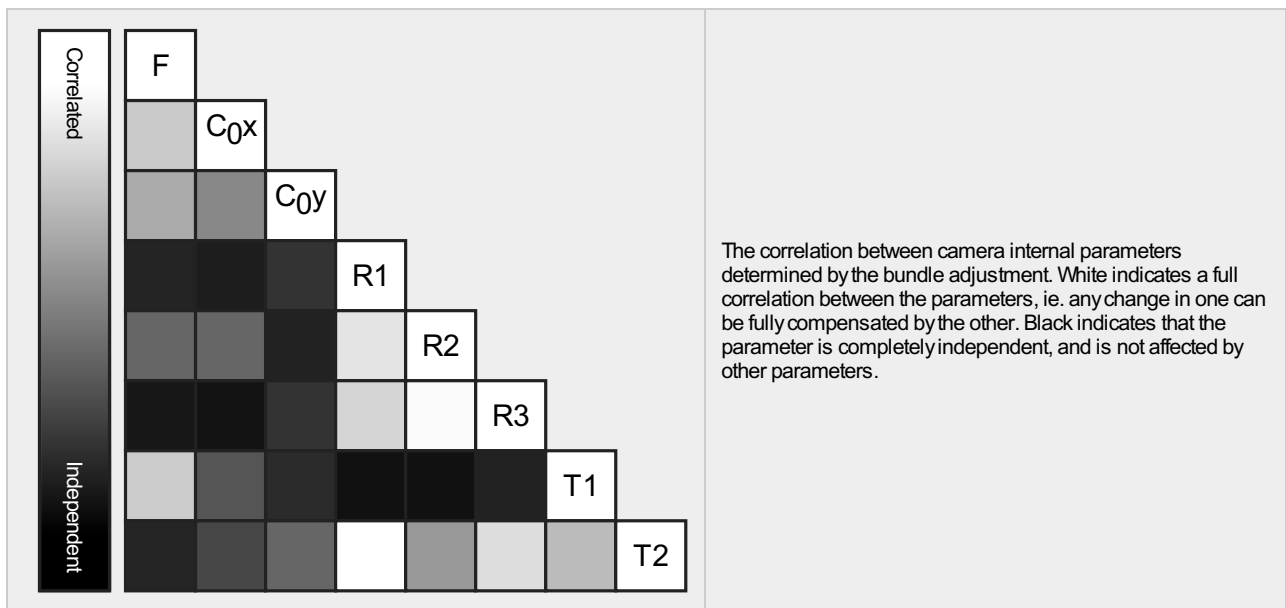
Internal Camera Parameters

FC6520_DJIMFT15mmF1.7ASPH_15.0_5280x3956 (RGB)(1). Sensor Dimensions: 17.500 [mm] x 13.112 [mm]



EXIF ID: FC6520_DJIMFT15mmF1.7ASPH_15.0_5280x3956

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	4564.399 [pixel] 15.128 [mm]	2698.159 [pixel] 8.943 [mm]	1910.765 [pixel] 6.333 [mm]	-0.004	-0.043	0.087	-0.003	0.004
Optimized Values	5453.246 [pixel] 18.074 [mm]	2683.618 [pixel] 8.895 [mm]	1987.630 [pixel] 6.588 [mm]	-0.006	-0.004	0.017	0.000	0.001
Uncertainties (Sigma)	31.090 [pixel] 0.103 [mm]	1.418 [pixel] 0.005 [mm]	3.510 [pixel] 0.012 [mm]	0.001	0.003	0.006	0.000	0.000



2D Keypoints Table



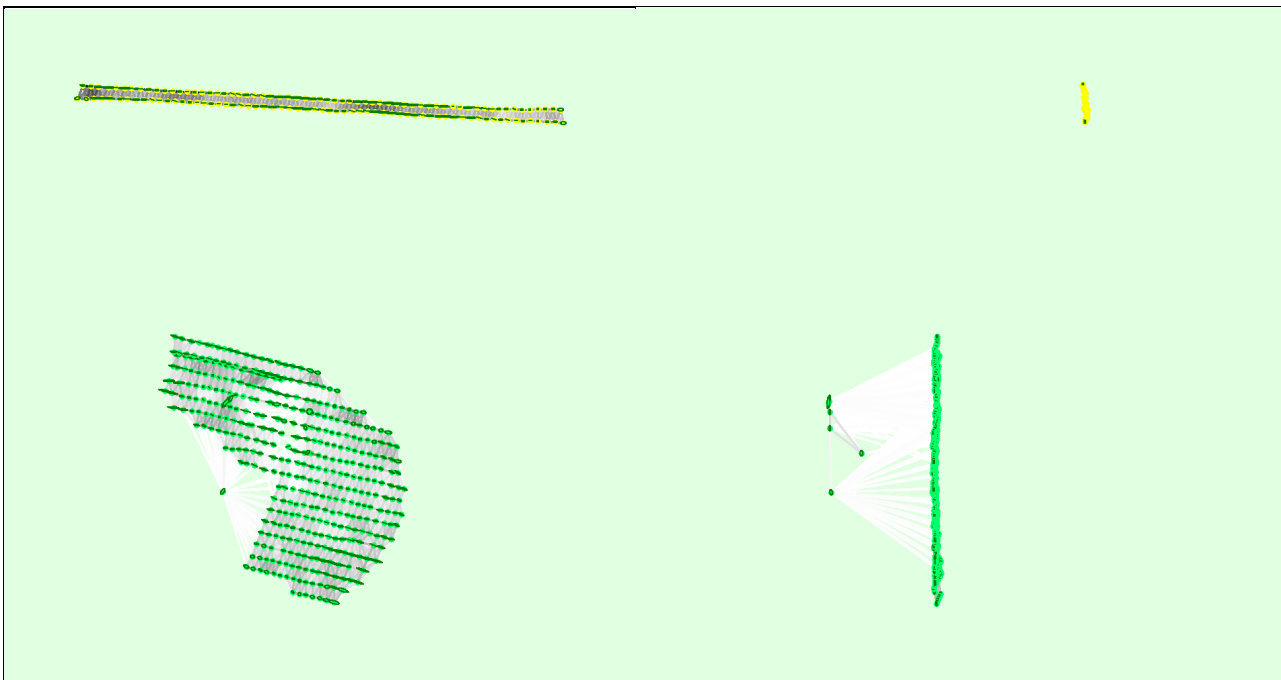
	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	4418	1078
Mn	3213	70
Max	10447	2751
Mean	4872	1200

3D Points from 2D Keypoint Matches



	Number of 3D Points Observed
In 2 Images	81181
In 3 Images	42564
In 4 Images	24895
In 5 Images	11191
In 6 Images	7725
In 7 Images	5790
In 8 Images	4641
In 9 Images	2216
In 10 Images	1444
In 11 Images	881
In 12 Images	396
In 13 Images	260
In 14 Images	142
In 15 Images	85
In 16 Images	67
In 17 Images	7
In 18 Images	4
In 19 Images	4

2D Keypoint Matches



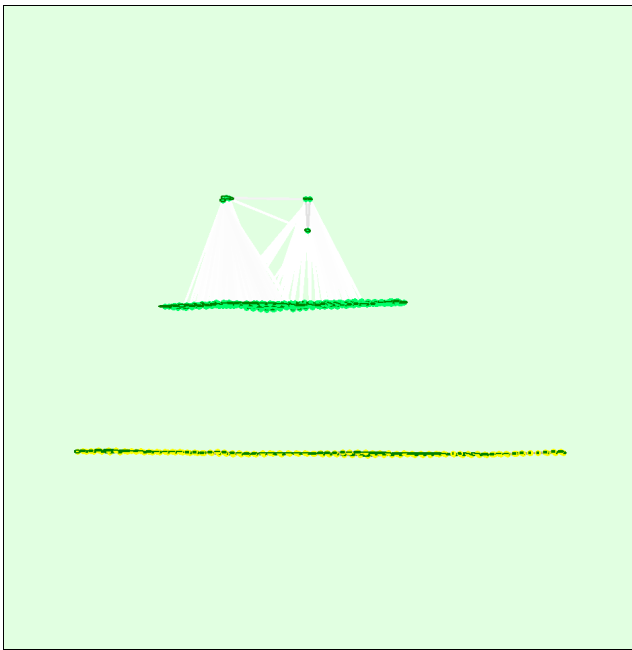


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty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

Relative camera position and orientation uncertainties

	X[US survey foot]	Y[US survey foot]	Z[US survey foot]	Omega [degree]	Phi [degree]	Kappa [degree]	Camera Displacement X[US survey foot]	Camera Displacement Y[US survey foot]	Camera Displacement Z[US survey foot]
Mean	0.844	0.281	0.128	0.105	0.383	0.077	0.098	0.066	0.350
Sigma	0.421	0.153	0.057	0.045	0.184	0.035	0.053	0.041	0.172

Geolocation Details

Absolute Geolocation Variance

Mn Error [US survey foot]	Max Error [US survey foot]	Geolocation Error X[%]	Geolocation Error Y[%]	Geolocation Error Z[%]
-	-49.21	0.00	0.00	0.00
-49.21	-39.37	0.00	0.00	0.77
-39.37	-29.53	0.19	0.19	0.19
-29.53	-19.68	4.02	4.98	0.19
-19.68	-9.84	17.24	14.37	0.00
-9.84	0.00	28.93	30.46	39.85
0.00	9.84	31.61	32.18	59.00
9.84	19.69	12.64	12.45	0.00
19.69	29.53	4.60	4.79	0.00
29.53	39.37	0.57	0.57	0.00
39.37	49.21	0.19	0.00	0.00
49.21	-	0.00	0.00	0.00
Mean [US survey foot]		0.000001	-0.000001	-0.000038
Sigma [US survey foot]		11.498382	11.402665	4.749885
RMS Error [US survey foot]		11.498382	11.402665	4.749885

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



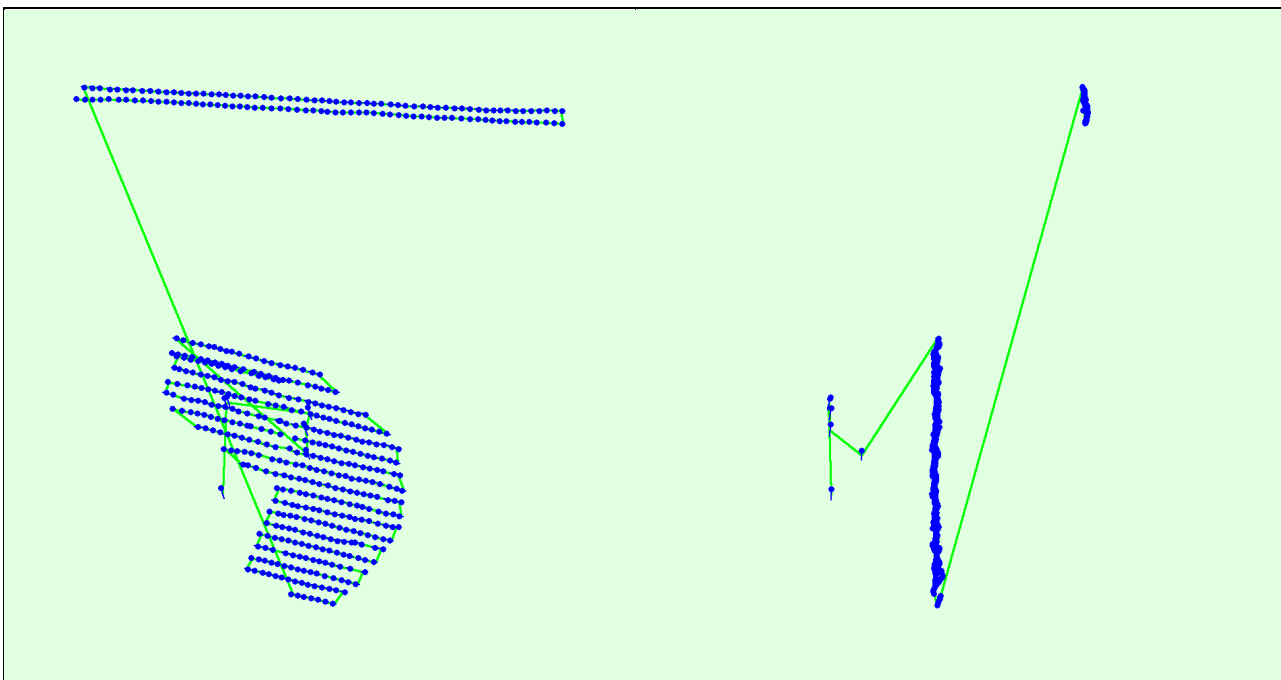
Relative Geolocation Error	Images X[%]	Images Y[%]	Images Z[%]
[-1.00, 1.00]	85.63	82.57	99.04
[-2.00, 2.00]	99.43	99.81	100.00
[-3.00, 3.00]	100.00	100.00	100.00
Mean of Geolocation Accuracy [US survey foot]	16.404167	16.404167	32.808333
Sigma of Geolocation Accuracy [US survey foot]	0.000003	0.000003	0.000006

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

Geolocation Orientational Variance	RMS [degree]
Omega	1.983
Phi	2.832
Kappa	2.779

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

Rolling Shutter Statistics



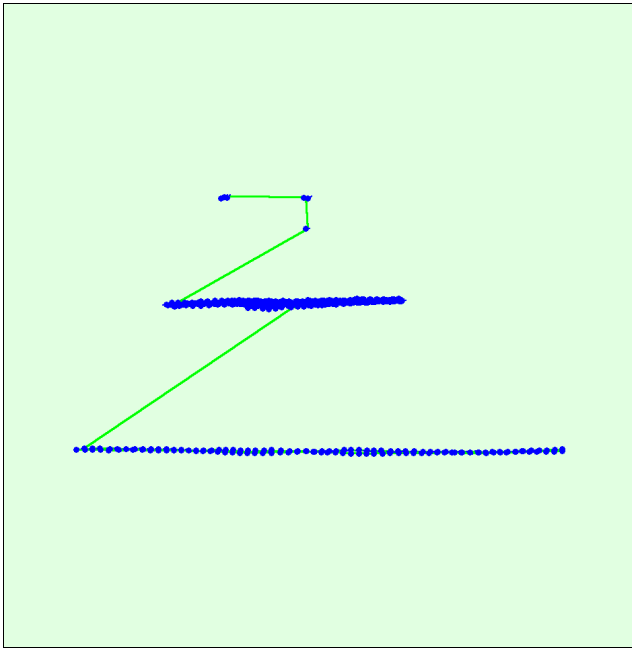


Figure 6: Camera movement estimated by the rolling shutter camera model. The green line follows the computed image positions. The blue dots represent the camera position at the start of the exposure. The blue lines represent the camera motion during the rolling shutter readout, re-scaled by a project dependant scaling factor for better visibility.

Median Camera Speed	10.9607 [US survey foot/s]
Median Camera Displacement During Sensor Readout)	11.6789 [US survey foot]
Median Rolling Shutter Readout Time	1081.7076 [ms]

Initial Processing Details

System Information

Hardware	CPU: 12th Gen Intel(R) Core(TM) i7-12850HX RAM: 32GB GPU: Intel(R) UHD Graphics (Driver: 31.0.101.4644), NVDIARTXA1000 Laptop GPU (Driver: 31.0.15.2879)
Operating System	Windows 10 Enterprise, 64-bit

Coordinate Systems

Image Coordinate System	WGS 84 (EGM96 Geoid)
Output Coordinate System	NAD_1983_StatePlane_Idaho_West_FIPS_1103_Feet (deprecated) (EGM96 Geoid)

Processing Options

Detected Template	3D Maps - Rapid/Low Res
Keypoints Image Scale	Rapid, Image Scale: 0.25
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, 1/4 (Quarter image size, Fast)
Point Density	Low (Fast)
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	21m:24s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	08m:23s

Results



Number of Generated Tiles	1
Number of 3D Densified Points	5033096
Average Density (per US survey foot ³)	20.87

DSM, Orthomosaic and Index Details



Processing Options



DSM and Orthomosaic Resolution	4 x GSD (0.73 [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	04m:42s
Time for Orthomosaic Generation	33m:53s
Time for DTM Generation	00s
Time for Contour Lines Generation	00s
Time for Reflectance Map Generation	00s
Time for Index Map Generation	00s