Quality Report

Generated with PIX4Dmapper version 4.8.4

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	umtoval_nadir_rgb200ft
Processed	2025-09-21 09:33:32
Camera Model Name(s)	M3T_4.4_4000x3000 (RGB)
Average Ground Sampling Distance (GSD)	2.07 cm / 0.81 in
Area Covered	0.053 km^2 / 5.3266 ha / 0.02 sq. mi. / 13.1692 acres
Time for Initial Processing (without report)	03m:30s

Quality Check

Images	median of 3341 keypoints per image	✓
Dataset	279 out of 279 images calibrated (100%), all images enabled	✓
Camera Optimization	0.55% relative difference between initial and optimized internal camera parameters	✓
Matching	median of 1561.12 matches per calibrated image	✓
Georeferencing	yes, no 3D GCP	⚠

Preview

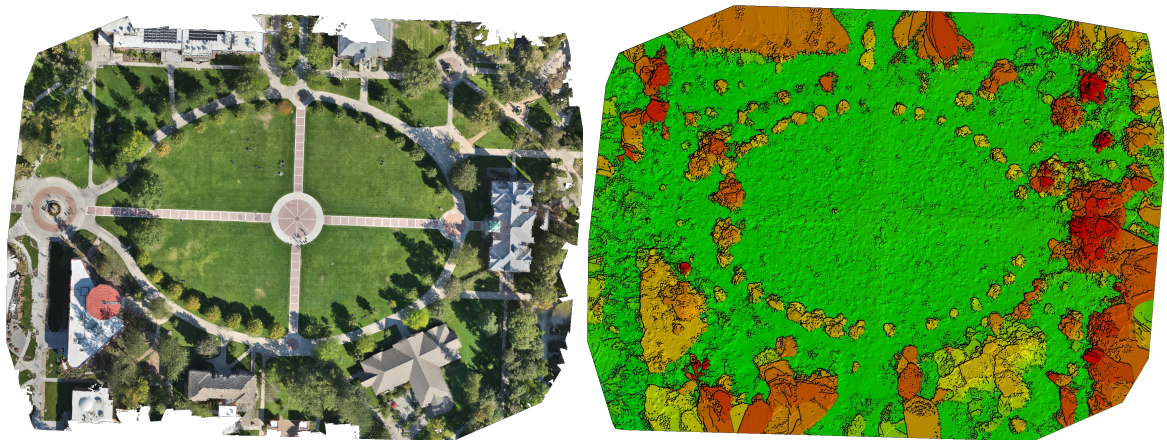


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

Calibration Details

Number of Calibrated Images	279 out of 279
Number of Geolocated Images	279 out of 279

Initial Image Positions

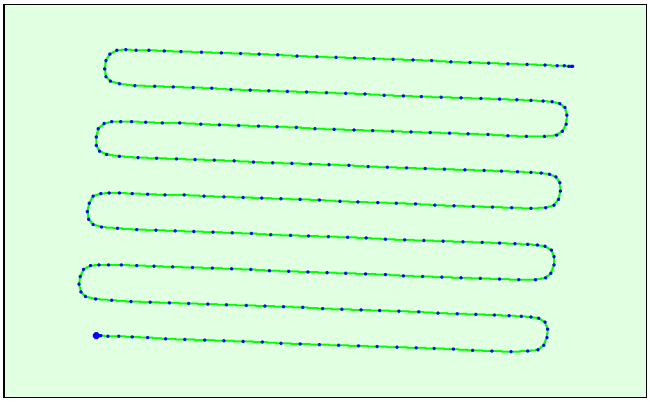


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

Computed Image/GCPs/Manual Tie Points Positions

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	0.006	0.005	0.004	0.006	0.006	0.005
Sigma	0.000	0.000	0.000	0.000	0.000	0.001

Overlap

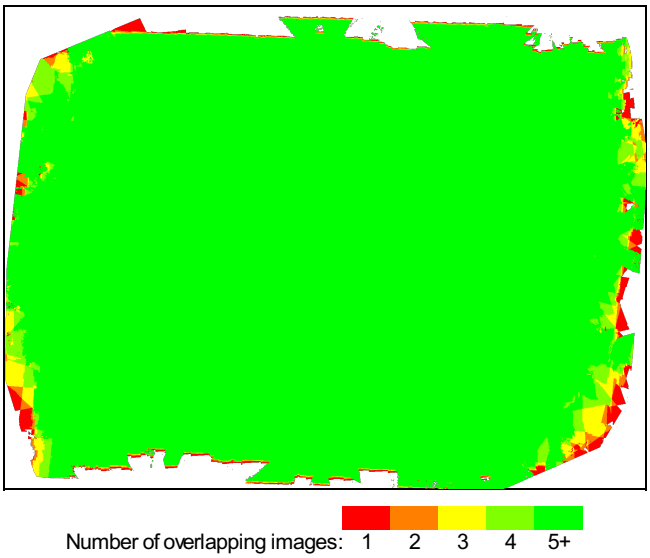


Figure 4: Number of overlapping images computed for each pixel of the orthomosaic.
Red and yellow areas indicate low overlap for which poor results may be generated. Green areas indicate an overlap of over 5 images for every pixel. Good quality results will be generated as long as the number of keypoint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

Bundle Block Adjustment Details

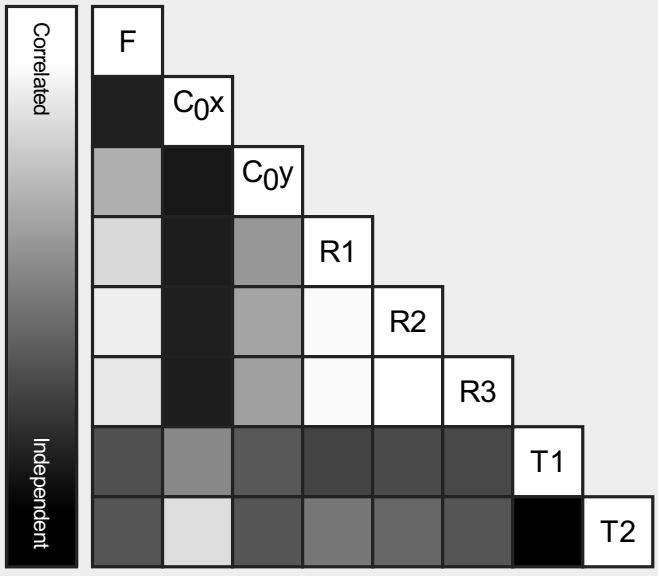
Number of 2D Keypoint Observations for Bundle Block Adjustment	436703
Number of 3D Points for Bundle Block Adjustment	112646
Mean Reprojection Error [pixels]	0.132

Internal Camera Parameters

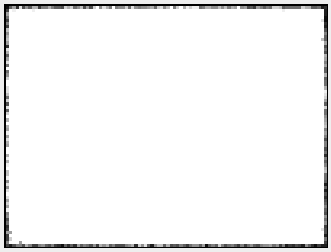
M3T_4.4_4000x3000 (RGB). Sensor Dimensions: 6.400 [mm] x 4.800 [mm]

EXIF ID: M3T_4.4_4000x3000

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	2873.340 [pixel] 4.597 [mm]	2009.980 [pixel] 3.216 [mm]	1485.010 [pixel] 2.376 [mm]	0.178	-0.431	0.218	-0.000	0.000
Optimized Values	2889.253 [pixel] 4.623 [mm]	1984.045 [pixel] 3.174 [mm]	1520.656 [pixel] 2.433 [mm]	0.170	-0.417	0.209	-0.001	0.000
Uncertainties (Sigma)	4.471 [pixel] 0.007 [mm]	0.120 [pixel] 0.000 [mm]	0.140 [pixel] 0.000 [mm]	0.001	0.003	0.002	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

	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	3341	1561
Min	2644	1100
Max	3956	2812
Mean	3342	1565

3D Points from 2D Keypoint Matches

	Number of 3D Points Observed
In 2 Images	69223
In 3 Images	16276
In 4 Images	7605
In 5 Images	4306
In 6 Images	2818
In 7 Images	1924
In 8 Images	1461
In 9 Images	1041
In 10 Images	859
In 11 Images	763
In 12 Images	733
In 13 Images	598
In 14 Images	507
In 15 Images	454
In 16 Images	399
In 17 Images	376
In 18 Images	308
In 19 Images	298
In 20 Images	268
In 21 Images	278
In 22 Images	243
In 23 Images	212
In 24 Images	177
In 25 Images	194
In 26 Images	123
In 27 Images	134
In 28 Images	126
In 29 Images	95
In 30 Images	90
In 31 Images	90
In 32 Images	84
In 33 Images	76
In 34 Images	65
In 35 Images	41
In 36 Images	72
In 37 Images	50
In 38 Images	45
In 39 Images	28
In 40 Images	22

In 41 Images	18
In 42 Images	15
In 43 Images	22
In 44 Images	18
In 45 Images	19
In 46 Images	22
In 47 Images	11
In 48 Images	14
In 49 Images	7
In 50 Images	10
In 51 Images	4
In 52 Images	3
In 53 Images	4
In 54 Images	2
In 55 Images	4
In 56 Images	5
In 57 Images	2
In 58 Images	4

2D Keypoint Matches

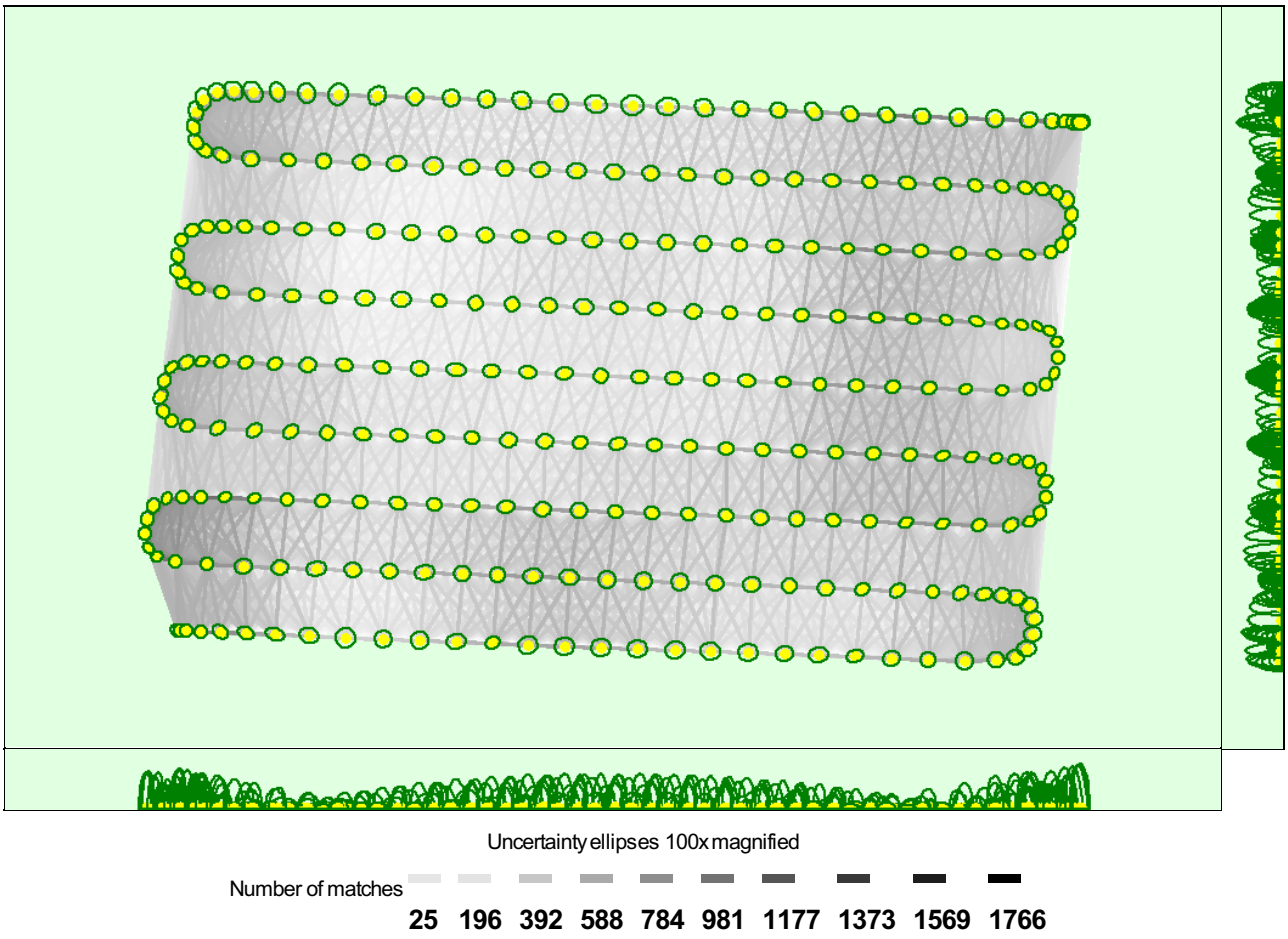


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty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

Relative camera position and orientation uncertainties

	X [m]	Y [m]	Z [m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.018	0.016	0.043	0.057	0.082	0.006
Sigma	0.002	0.002	0.023	0.033	0.041	0.001

Geolocation Details

Absolute Geolocation Variance

Min Error [m]	Max Error [m]	Geolocation Error X [%]	Geolocation Error Y [%]	Geolocation Error Z [%]
-	-0.06	0.00	0.00	1.43
-0.06	-0.05	0.00	0.00	2.15
-0.05	-0.04	0.00	0.00	5.73
-0.04	-0.03	0.72	0.36	11.83
-0.03	-0.01	8.60	3.23	21.51
-0.01	0.00	41.58	48.39	15.41
0.00	0.01	44.09	44.44	10.75
0.01	0.03	4.30	3.58	9.68
0.03	0.04	0.36	0.00	5.38
0.04	0.05	0.36	0.00	6.81
0.05	0.06	0.00	0.00	5.02
0.06	-	0.00	0.00	4.30
Mean [m]		-0.000041	0.000009	-0.000005
Sigma [m]		0.009806	0.006855	0.033130
RMS Error [m]		0.009806	0.006855	0.033130

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]	98.21	99.64	75.99
[-2.00, 2.00]	100.00	100.00	98.92
[-3.00, 3.00]	100.00	100.00	100.00
Mean of Geolocation Accuracy [m]	0.022953	0.022953	0.038938
Sigma of Geolocation Accuracy [m]	0.000211	0.000211	0.000591

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

Geolocation Orientational Variance	RMS [degree]
Omega	0.489
Phi	0.768
Kappa	0.563

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: 13th Gen Intel(R) Core(TM) i7-13700 RAM: 16GB GPU: AMD Radeon RX 6500 (Driver: 32.0.21010.10), Intel(R) UHD Graphics 770 (Driver: 32.0.101.6881)
Operating System	Windows 11, 64-bit

Coordinate Systems

Image Coordinate System	WGS 84
Output Coordinate System	WGS 84 / UTM zone 12N

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, yes