RELATÓRIO DE PROCESSAMENTO

AEROLEVANTAMENTO - ÁREA JARAGUÁ - MACEIÓ/AL - 08.06.2023

08 June 2023

Survey Data

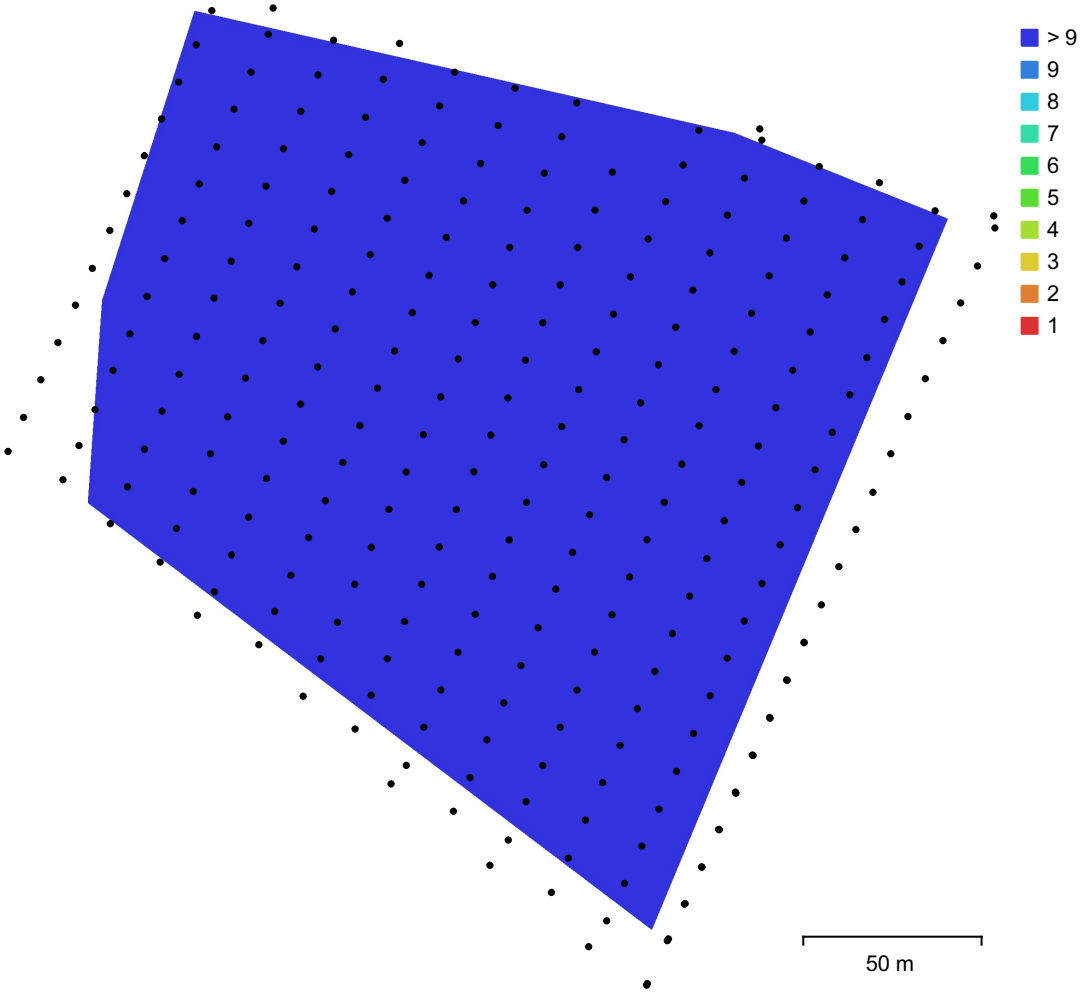

Fig. 1. Camera locations and image overlap.

Number of images:	256	Camera stations:	253
Flying altitude:	75.9 m	Tie points:	165,306
Ground resolution:	1.64 cm/pix	Projections:	932,707
Coverage area:	0.0375 km²	Reprojection error:	0.682 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
L1D-20c (10.26mm)	5472 x 3648	10.26 mm	2.41 x 2.41 µm	No

Table 1. Cameras.

Camera Calibration

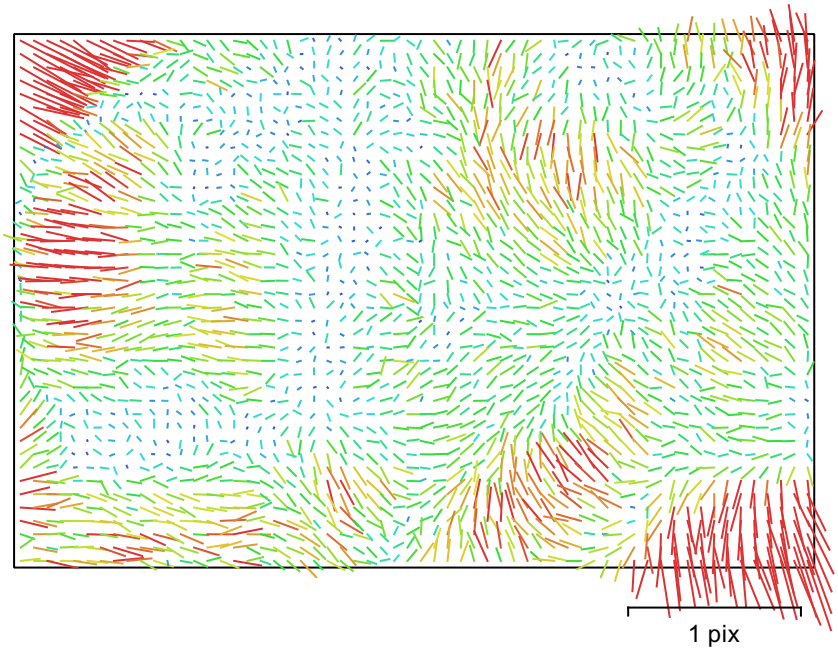

Fig. 2. Image residuals for L1D-20c (10.26mm).

L1D-20c (10.26mm)

256 images

Type	Resolution	Focal Length	Pixel Size
Frame	**5472 x 3648**	**10.26 mm**	**2.41 x 2.41 µm**

	Value	Error	Cx	Cy	B1	B2	K1	K2	K3	P1	P2
F	**4256**										
Cx	**-33.0572**	0.021	1.00	-0.02	-0.02	-0.00	-0.05	0.04	-0.04	0.63	-0.00
Cy	**-6.70779**	0.016		1.00	0.00	0.05	-0.00	-0.01	0.01	0.01	0.52
B1	**-11.9745**	0.04			1.00	-0.00	-0.00	-0.00	0.00	-0.01	0.01
B2	**0.0696382**	0.039				1.00	-0.00	0.00	-0.00	-0.02	0.01
K1	**-0.0235567**	3e-05					1.00	-0.76	0.71	-0.32	0.18
K2	**0.0309415**	8.9e-05						1.00	-0.98	0.06	0.00
K3	**-0.0275267**	0.0001							1.00	-0.06	-0.01
P1	**-0.00172414**	1.5e-06								1.00	-0.12
P2	**-0.000806565**	9.9e-07									1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Locations

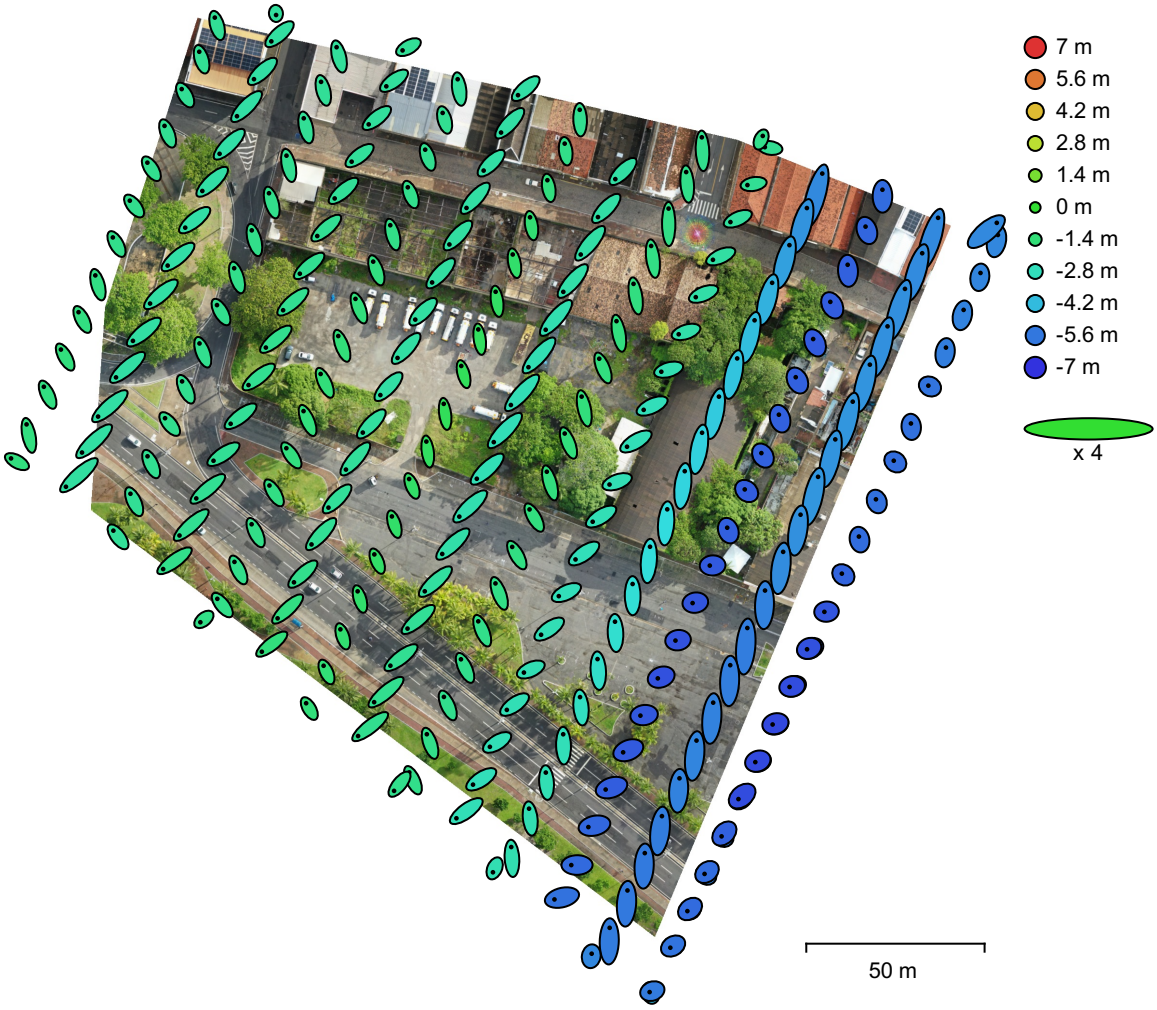

Fig. 3. Camera locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated camera locations are marked with a black dot.

X error (m)	Y error (m)	Z error (m)	XY error (m)	Total error (m)
0.823588	1.30337	3.61269	1.54177	3.92793

Table 3. Average camera location error.
X - Easting, Y - Northing, Z - Altitude.

Ground Control Points

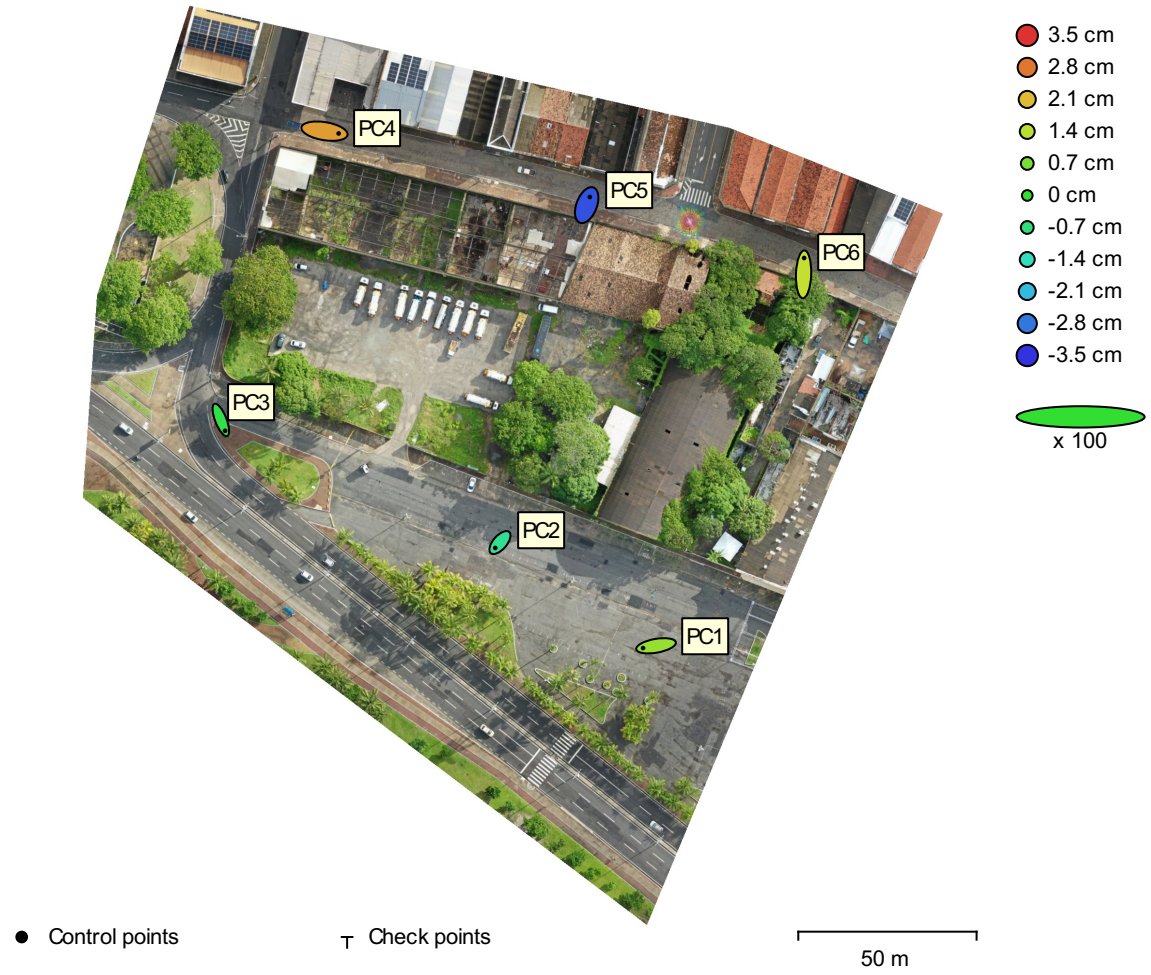

Fig. 4. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
6	4.69095	5.06177	1.83837	6.9012	7.14186

Table 4. Control points RMSE.
X - Easting, Y - Northing, Z - Altitude.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
PC1	-7.2824	-1.27585	1.02538	7.46409	0.501 (36)
PC2	-2.6483	-3.0255	-0.994572	4.14202	0.547 (28)
PC3	2.40963	-6.1	-0.226005	6.56258	0.600 (29)
PC4	7.93308	-1.29582	2.41709	8.39376	0.898 (32)
PC5	1.77534	4.54181	-3.18338	5.82355	0.987 (23)
PC6	0.302388	9.13403	1.48649	9.25913	0.866 (32)
Total	**4.69095**	**5.06177**	**1.83837**	**7.14186**	**0.746**

Table 5. Control points.
X - Easting, Y - Northing, Z - Altitude.

Digital Elevation Model

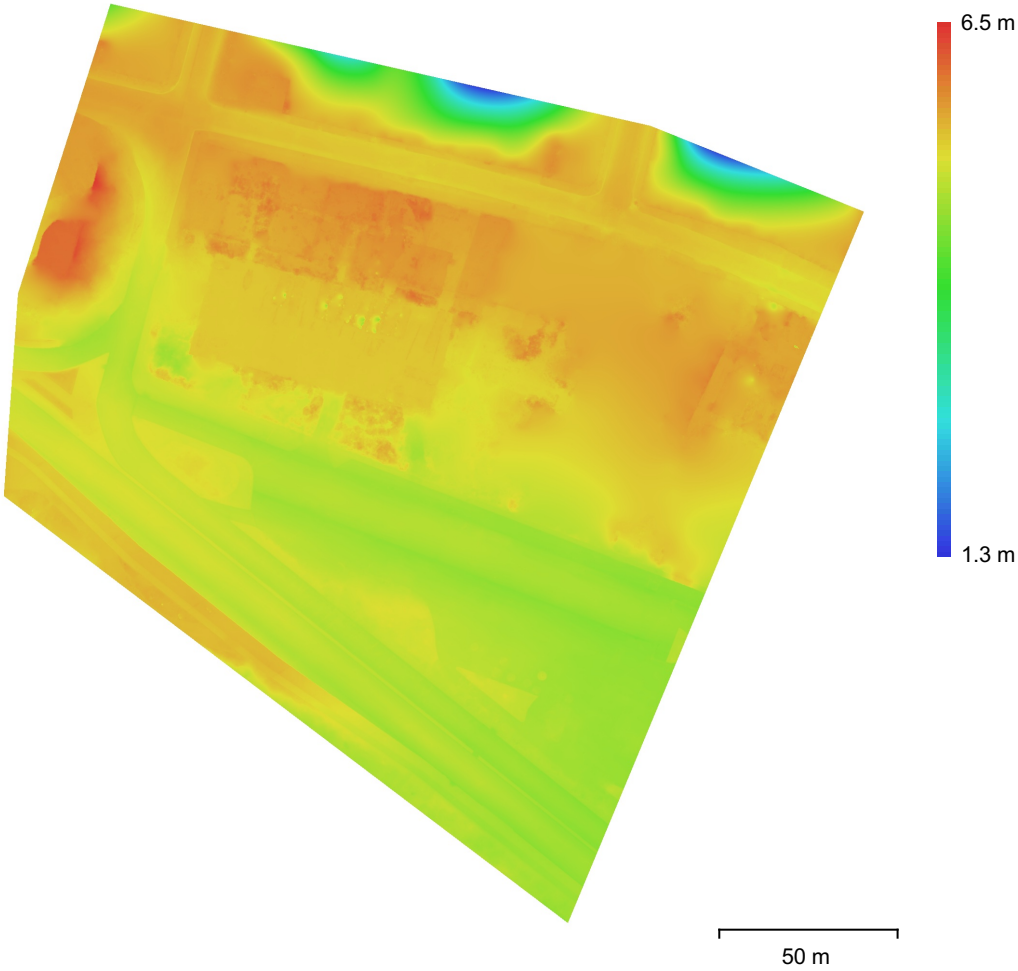

Fig. 5. Reconstructed digital elevation model.

Resolution:	3.28 cm/pix
Point density:	931 points/m²

Processing Parameters

General	
Cameras	256
Aligned cameras	253
Markers	12
Shapes	
Polygons	1
Coordinate system	SIRGAS 2000 / UTM zone 25S (EPSG::31985)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	165,306 of 209,927
RMS reprojection error	0.180436 (0.682281 pix)
Max reprojection error	0.549652 (45.7842 pix)
Mean key point size	3.25015 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	6.47382
Alignment parameters	
Accuracy	High
Generic preselection	Yes
Reference preselection	Source
Key point limit	50,000
Tie point limit	5,000
Guided image matching	No
Adaptive camera model fitting	Yes
Matching time	2 minutes 25 seconds
Matching memory usage	231.03 MB
Alignment time	3 minutes 28 seconds
Alignment memory usage	124.79 MB
Software version	1.7.0.11429
File size	35.49 MB
Depth Maps	
Count	253
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Processing time	31 minutes 35 seconds
Memory usage	9.27 GB
Software version	1.7.0.11429
File size	1.84 GB
Dense Point Cloud	
Points	104,567,891
Point colors	3 bands, uint8
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Processing time	31 minutes 35 seconds
Memory usage	9.27 GB
Dense cloud generation parameters	
Processing time	52 minutes 2 seconds
Memory usage	9.73 GB
Ground points classification parameters	

Max angle (°)	12.5
Max distance (m)	0.05
Cell size (m)	30
Classification time	16 minutes 58 seconds
Classification memory usage	3.81 GB
Software version	1.7.0.11429
File size	1.48 GB
DEM	
Size	15,948 x 15,398
Coordinate system	SIRGAS 2000 / UTM zone 25S (EPSG::31985)
Reconstruction parameters	
Source data	Dense cloud
Interpolation	Enabled
Processing time	2 minutes 11 seconds
Memory usage	301.32 MB
Software version	1.7.0.11429
File size	364.19 MB
Orthomosaic	
Size	22,441 x 23,947
Coordinate system	SIRGAS 2000 / UTM zone 25S (EPSG::31985)
Colors	3 bands, uint8
Reconstruction parameters	
Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Enable ghosting filter	No
Processing time	11 minutes 25 seconds
Memory usage	2.57 GB
Software version	1.7.0.11429
File size	5.53 GB
System	
Software name	Agisoft Metashape Professional
Software version	1.7.0 build 11429
OS	Windows 64 bit
RAM	61.93 GB
CPU	AMD Ryzen 5 3400G with Radeon Vega Graphics
GPU(s)	AMD Radeon RX 6700 XT (gfx1031)