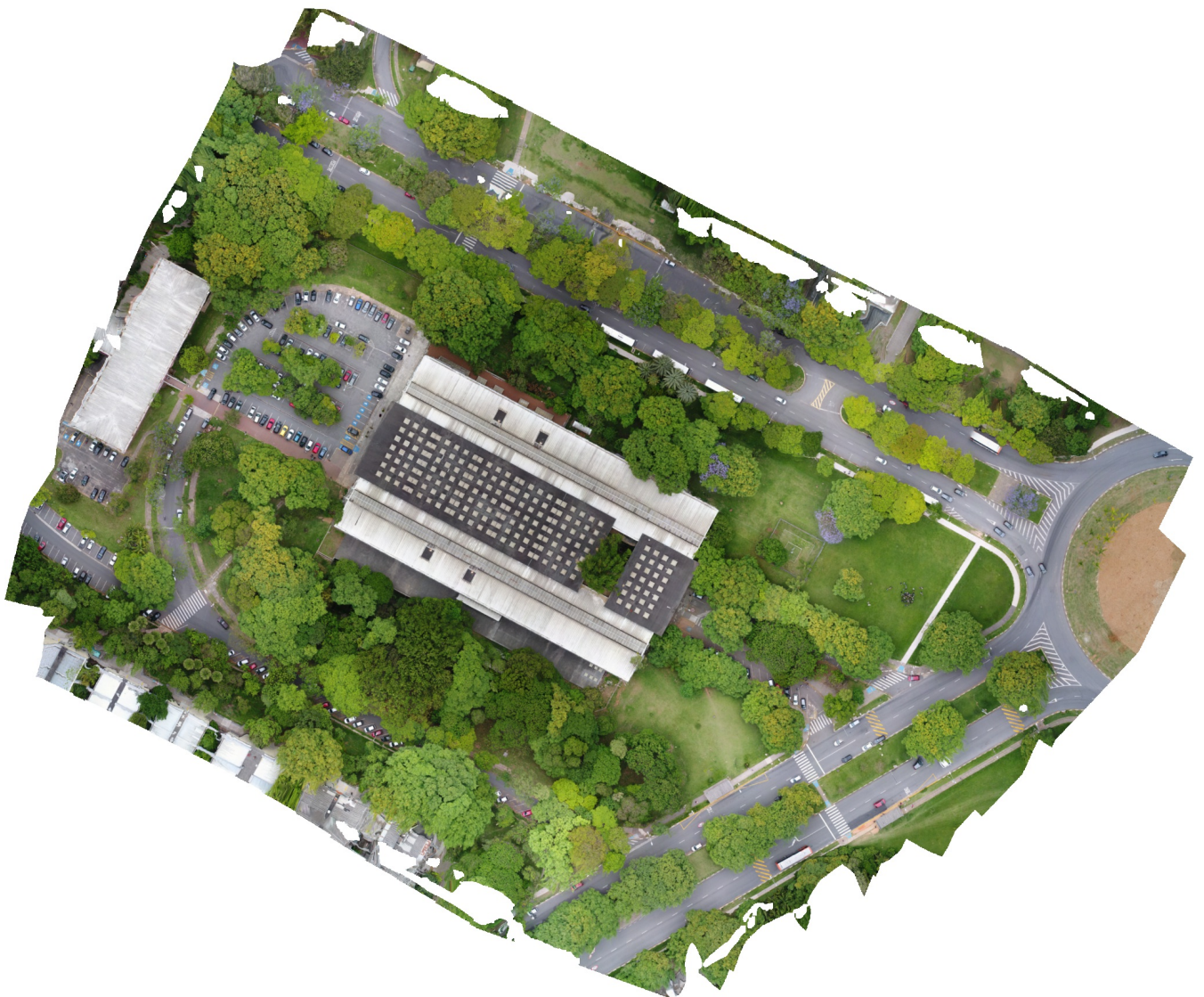


Demonstração - G drones

FFLCH USP - 20/10/17
Processamento em Baixa Qualidade

20 October 2017



Survey Data

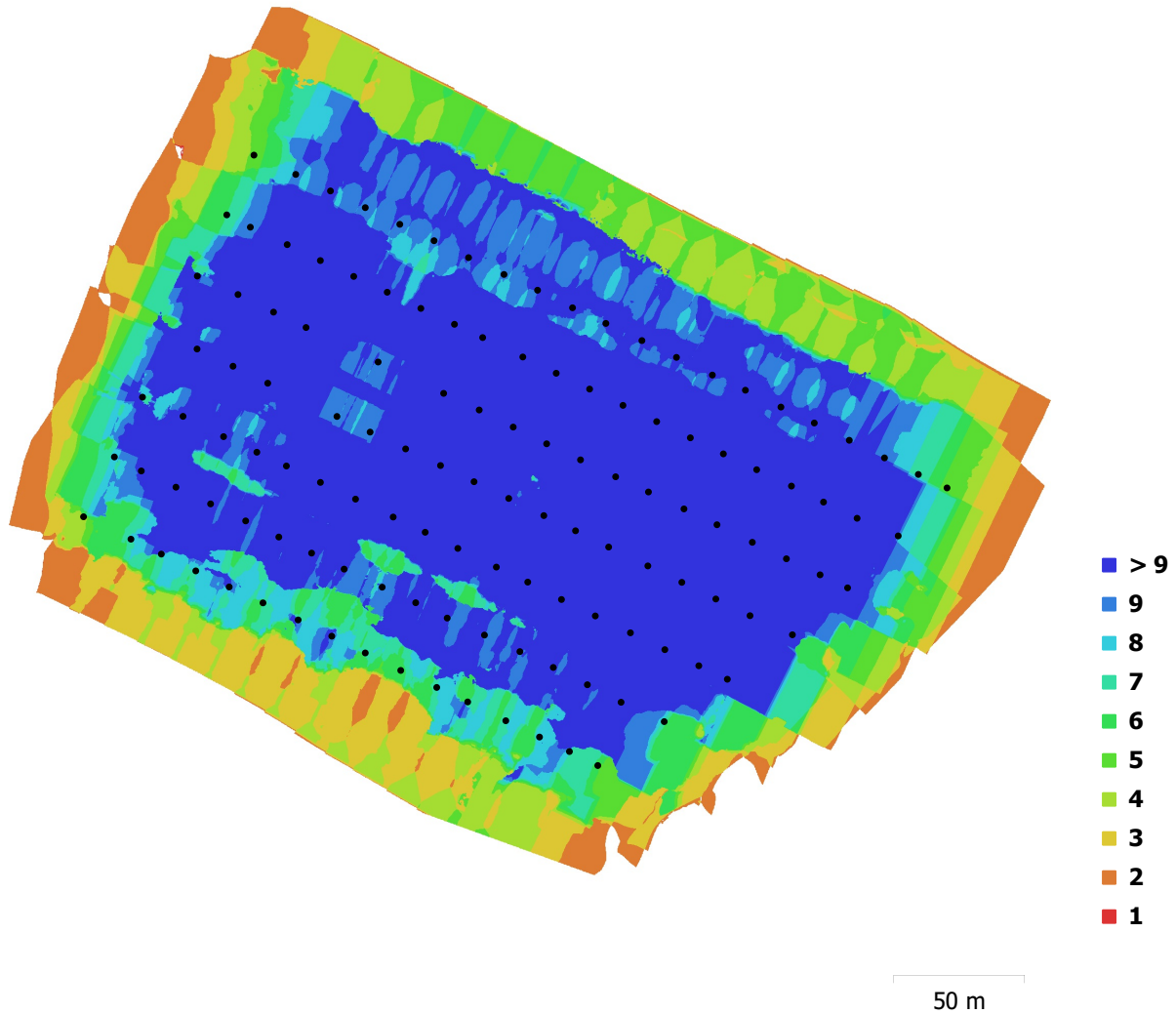


Fig. 1. Camera locations and image overlap.

Number of images:	128	Camera stations:	128
Flying altitude:	68.9 m	Tie points:	53,784
Ground resolution:	1.68 cm/pix	Projections:	157,889
Coverage area:	0.0792 km ²	Reprojection error:	2.3 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC6310 (8.8 mm)	5472 x 3648	8.8 mm	2.41 x 2.41 μ m	No

Table 1. Cameras.

Camera Calibration

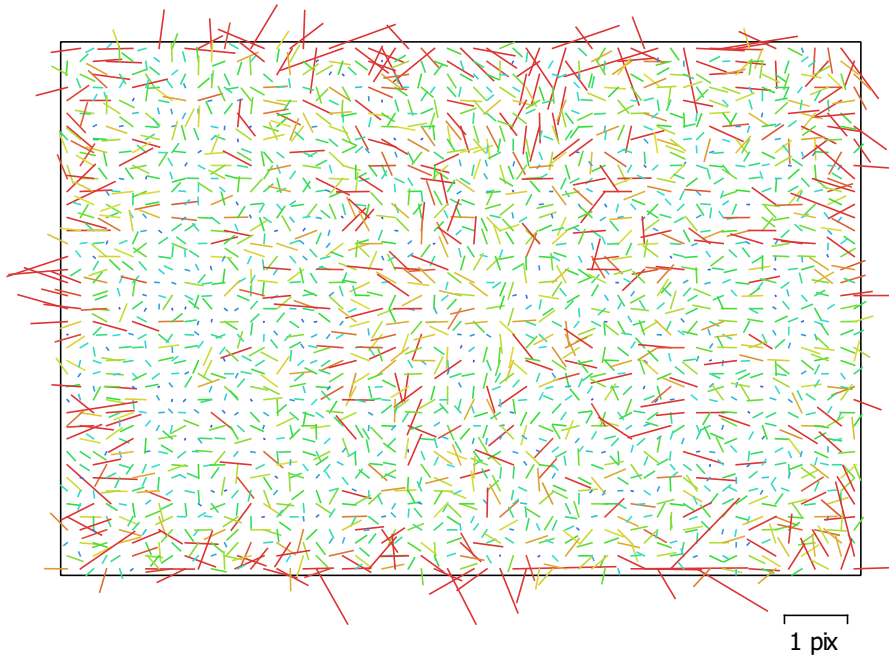


Fig. 2. Image residuals for FC6310 (8.8 mm).

FC6310 (8.8 mm)

128 images

Type
Frame

Resolution
5472 x 3648

Focal Length
8.8 mm

Pixel Size
2.41 x 2.41 μm

	Value	Error	P1	P2
F	3648			
P1	-8.82896e-05	1.3e-05	1.00	0.04
P2	-0.000228229	1.1e-05		1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Locations

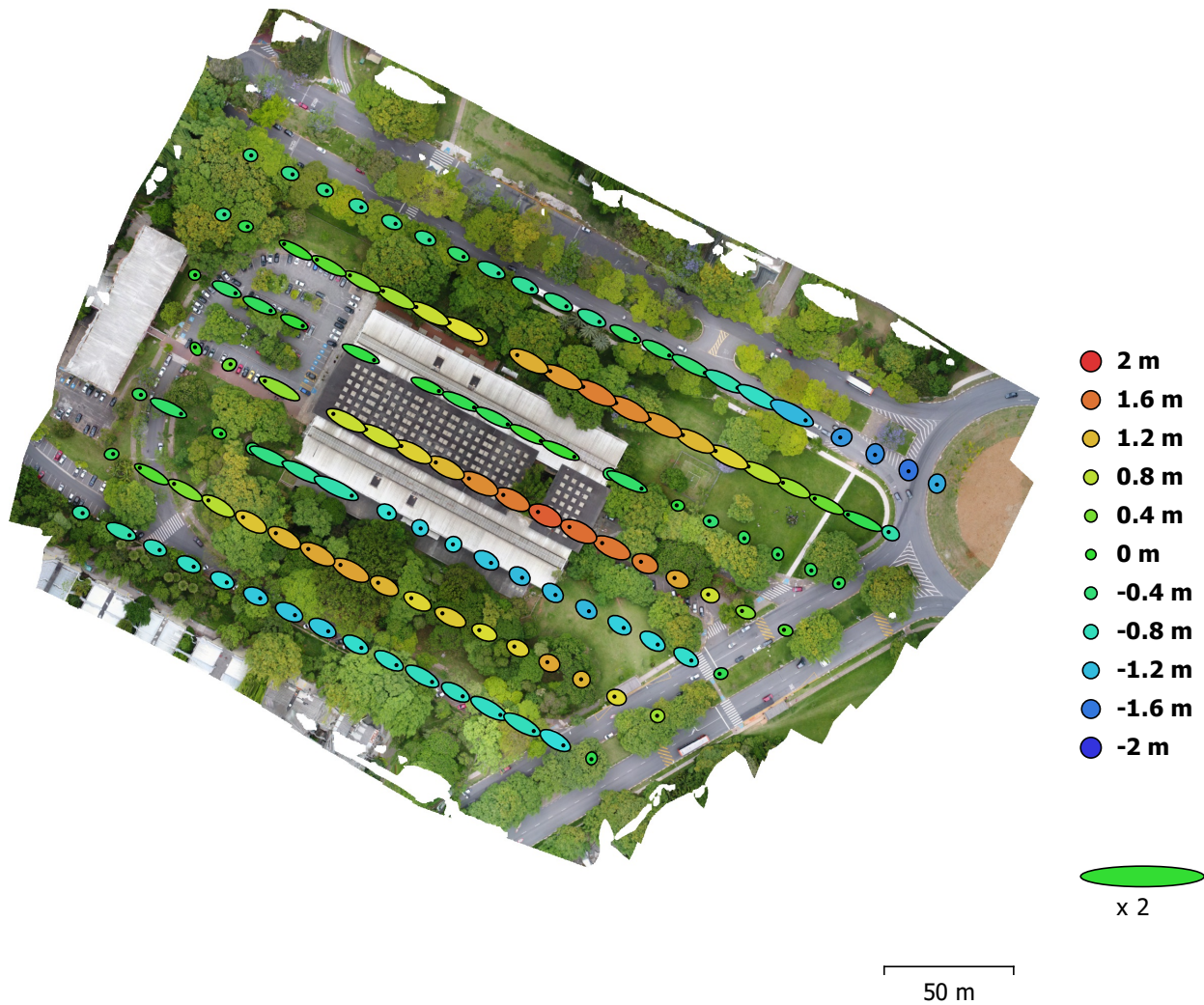


Fig. 3. Camera locations and error estimates.

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)
3.25842	1.6582	0.886324	3.65608	3.76198

Table 3. Average camera location error.
 X - Longitude, Y - Latitude, Z - Altitude.

Digital Elevation Model

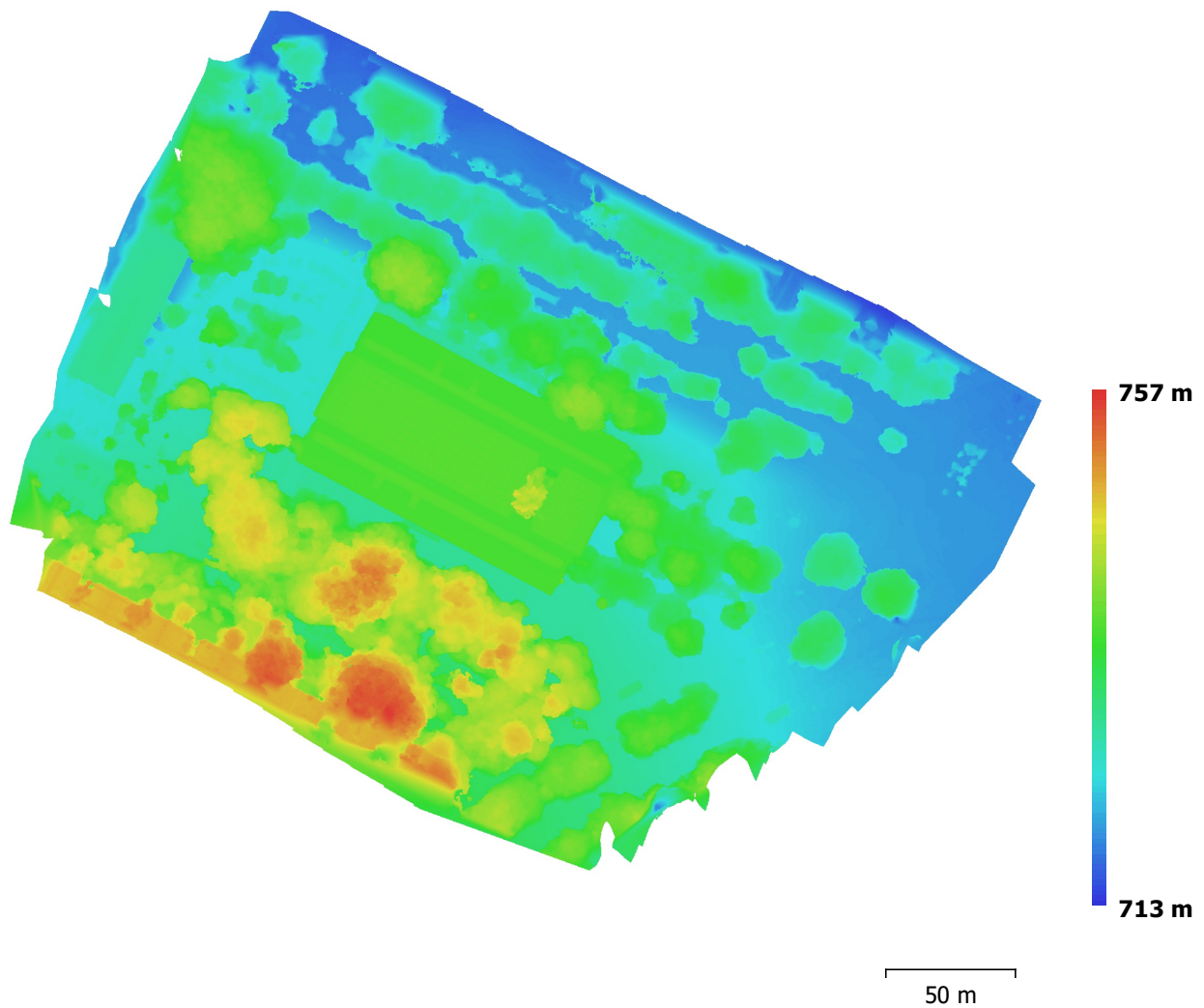


Fig. 4. Reconstructed digital elevation model.

Resolution: 13.5 cm/pix
Point density: 55.2 points/m²

Processing Parameters

General

Cameras	128
Aligned cameras	128
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	53,784 of 59,051
RMS reprojection error	0.137251 (2.3017 pix)
Max reprojection error	0.417085 (49.2041 pix)
Mean key point size	15.7117 pix
Effective overlap	3.12361

Alignment parameters

Accuracy	Low
Generic preselection	Yes
Reference preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	8 minutes 18 seconds
Alignment time	47 seconds

Depth Maps

Count	128
Reconstruction parameters	
Quality	Low
Filtering mode	Moderate
Processing time	28 minutes 6 seconds

Dense Point Cloud

Points	5,834,903
Reconstruction parameters	
Quality	Low
Depth filtering	Moderate
Depth maps generation time	28 minutes 6 seconds
Dense cloud generation time	3 minutes 14 seconds

Model

Faces	1,145,323
Vertices	574,331
Reconstruction parameters	
Surface type	Height field
Source data	Dense
Interpolation	Enabled
Quality	Low
Depth filtering	Moderate
Face count	1,166,979
Processing time	30 seconds

Tiled Model

Reconstruction parameters	
Source data	Mesh
Tile size	256
Processing time	1 hours 1 minutes

DEM

Size	3,563 x 2,993
Coordinate system	WGS 84 (EPSG::4326)
Reconstruction parameters	
Source data	Mesh
Interpolation	Enabled
Processing time	11 seconds

Orthomosaic

Size	23,652 x 19,708
Coordinate system	WGS 84 (EPSG::4326)
Channels	3, uint8

Reconstruction parameters

Blending mode	Mosaic
Surface	Mesh
Enable color correction	No
Enable hole filling	Yes
Processing time	25 minutes 27 seconds

Software

Version	1.3.2 build 4205
Platform	Windows 64