SMALL SCALE UNMANNED AIRCRAFT SYSTEM AND PHOTOGRAMMETRY APPLIED FOR 3D MODELING OF HISTORICAL BUILDINGS

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- *This paper presents a methodology for the 3D reconstruction of large-scale cultural assets, such as buildings using photogrammetry.*

Figure 1. "Palacete da Babilônia" Mavic Air2 aerial photo

Camera Parameters

Image Width	3968	px
Image Height	4000	px
Sensor Width	6.3	mm
Sensor Height	4.7	mm
Focal Length	4.49	mm

Flight hight: 45 m
GSD: 1.59cm/px

Spark -DJI

Camera Parameters

Image Width	4000	px
Image Height	3000	px
Sensor Width	6.3	mm
Sensor Height	4.7	mm
Focal Length	4.73	mm

Flight hight: 45 m
GSD: 1.50cm/px

Mavic Pro - DJI

Camera Parameters

Image Width	4000	px
Image Height	3000	px
Sensor Width	6.4	mm
Sensor Height	4.8	mm
Focal Length	4.50	mm

Flight hight: 45 m
GSD: 1.60cm/px

Mavic Air2 -DJI

Camera Parameters

Image Width	8000	px
Image Height	6000	px
Sensor Width	6.4	mm
Sensor Height	4.8	mm
Focal Length	4.50	mm

Flight hight: 45 m
GSD: 0.80cm/px

DirtMate   Propell

➤ **Flight examples with the Litchi app:**

➤ **Flight examples with the Copterus app:**

➤ **Flight examples with the Dronelink app:**

Orbit Mode Flight Planning
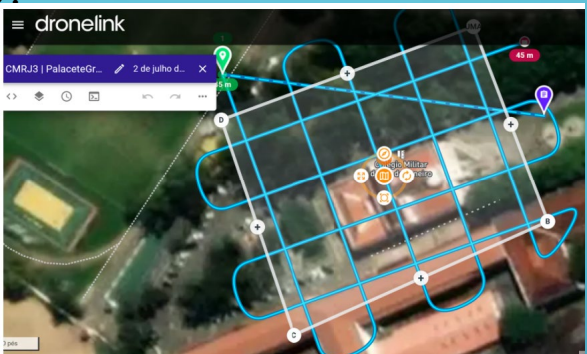
Grid Flight Planning
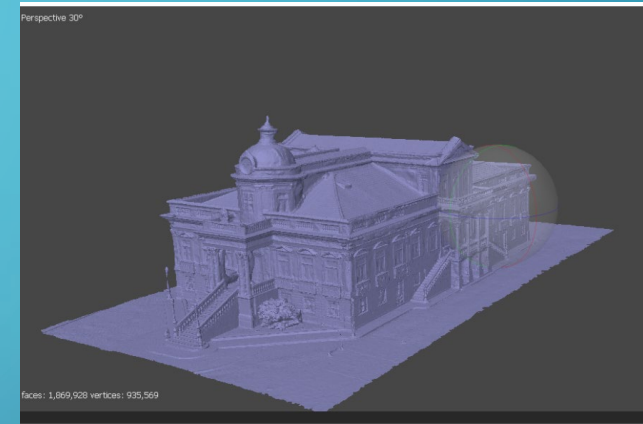

Waypoint Flight Planning
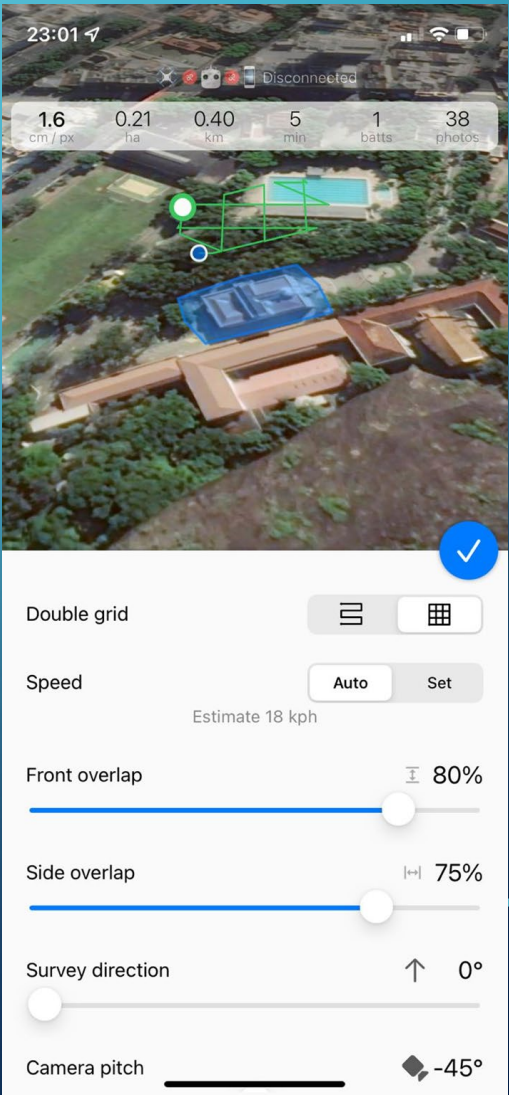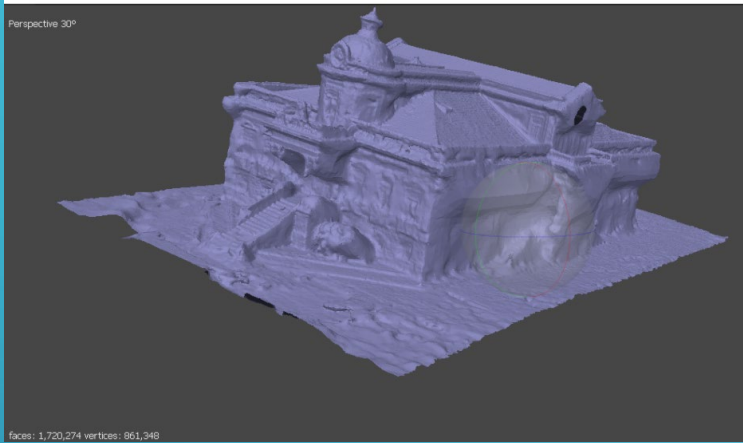
Mavic Pro 249 images in 16:9 format (dimension 4000 x 2250)
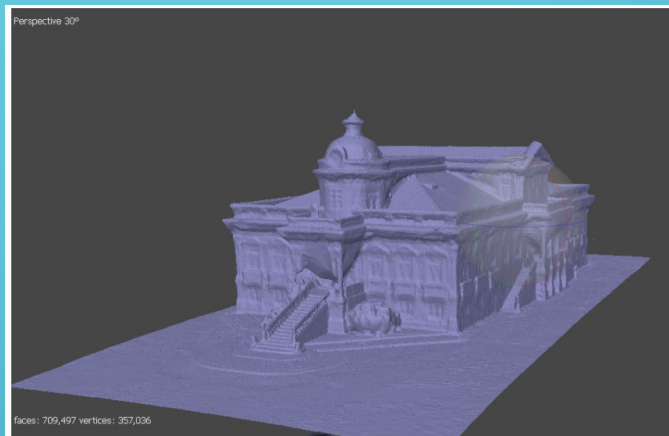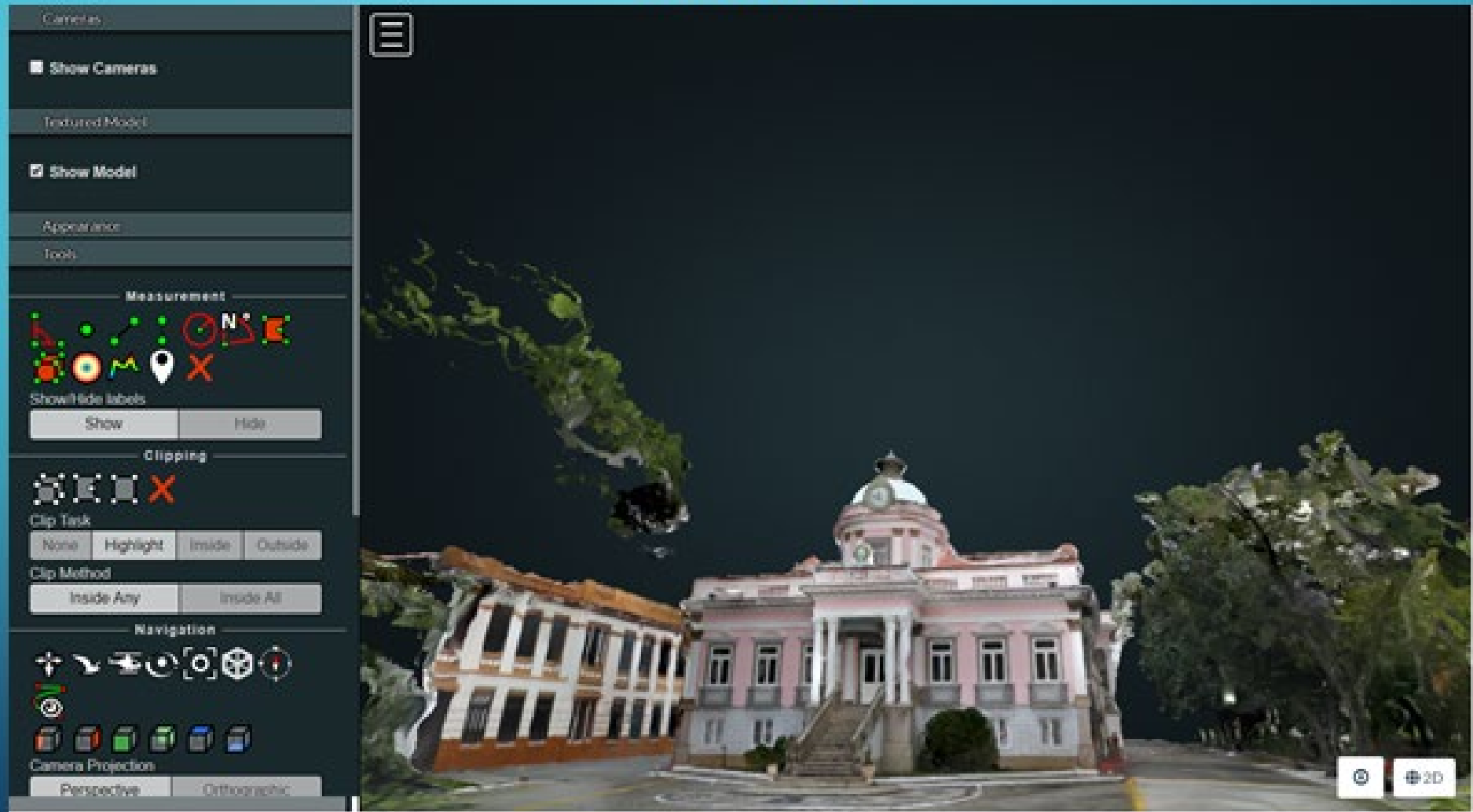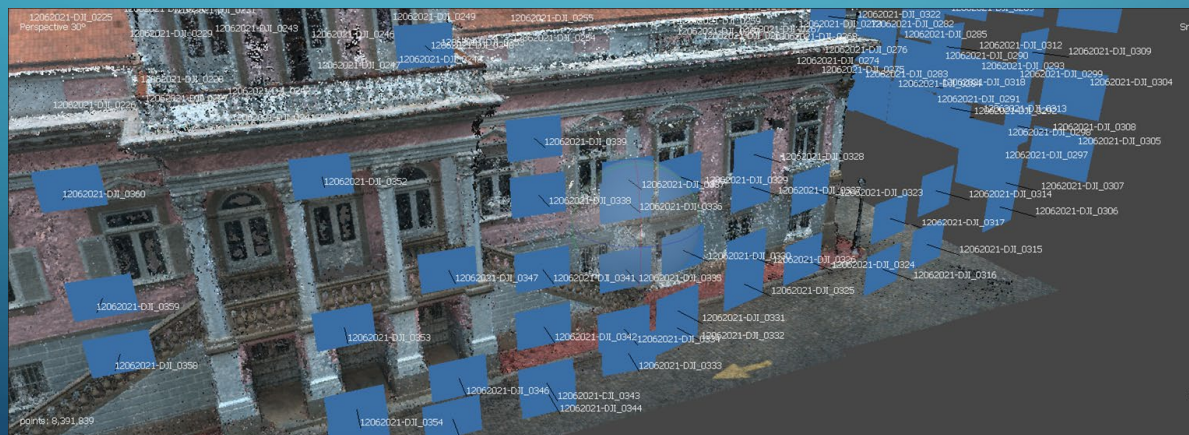
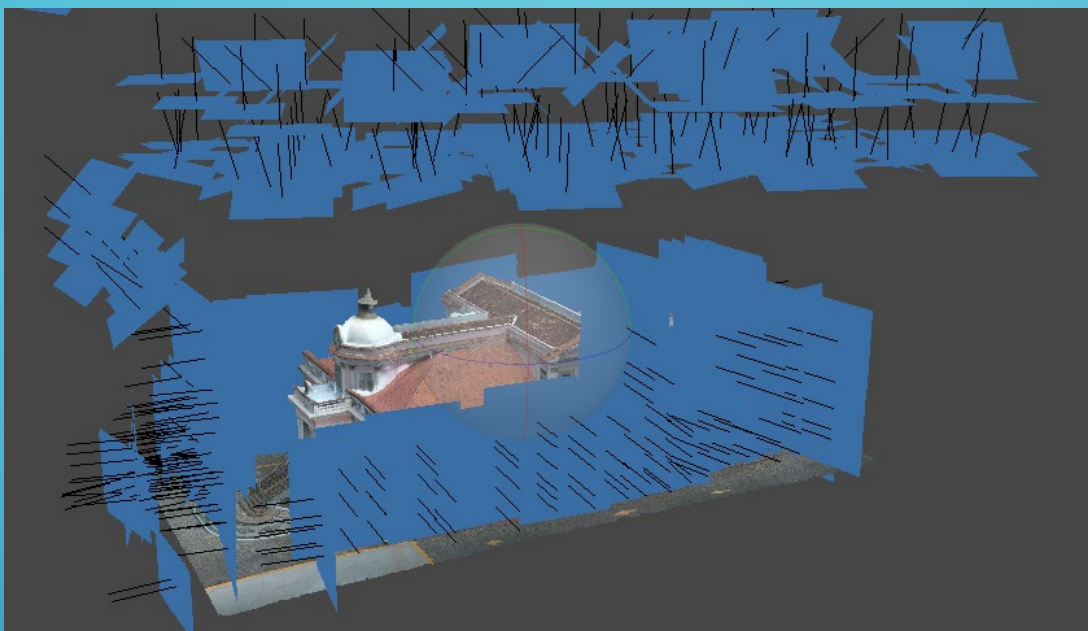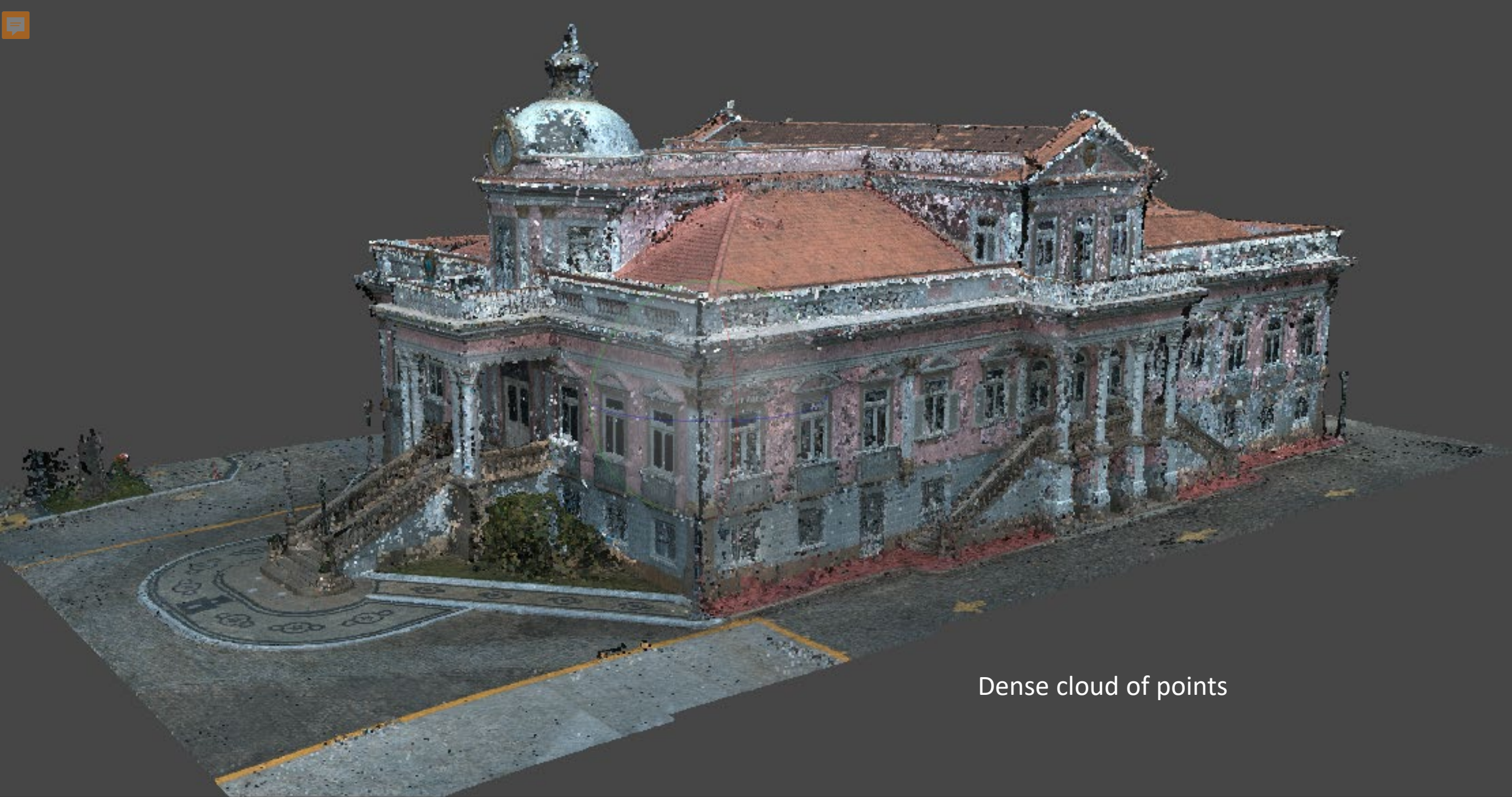Mavic Air 2 697 images in 4:3 format (Dimension 4000 x 3000)

Mavic Air 2 with 526 images, separated by groups of object faces

Presentation of the best result with Mavic Air 2 in OpenDroneMap software:
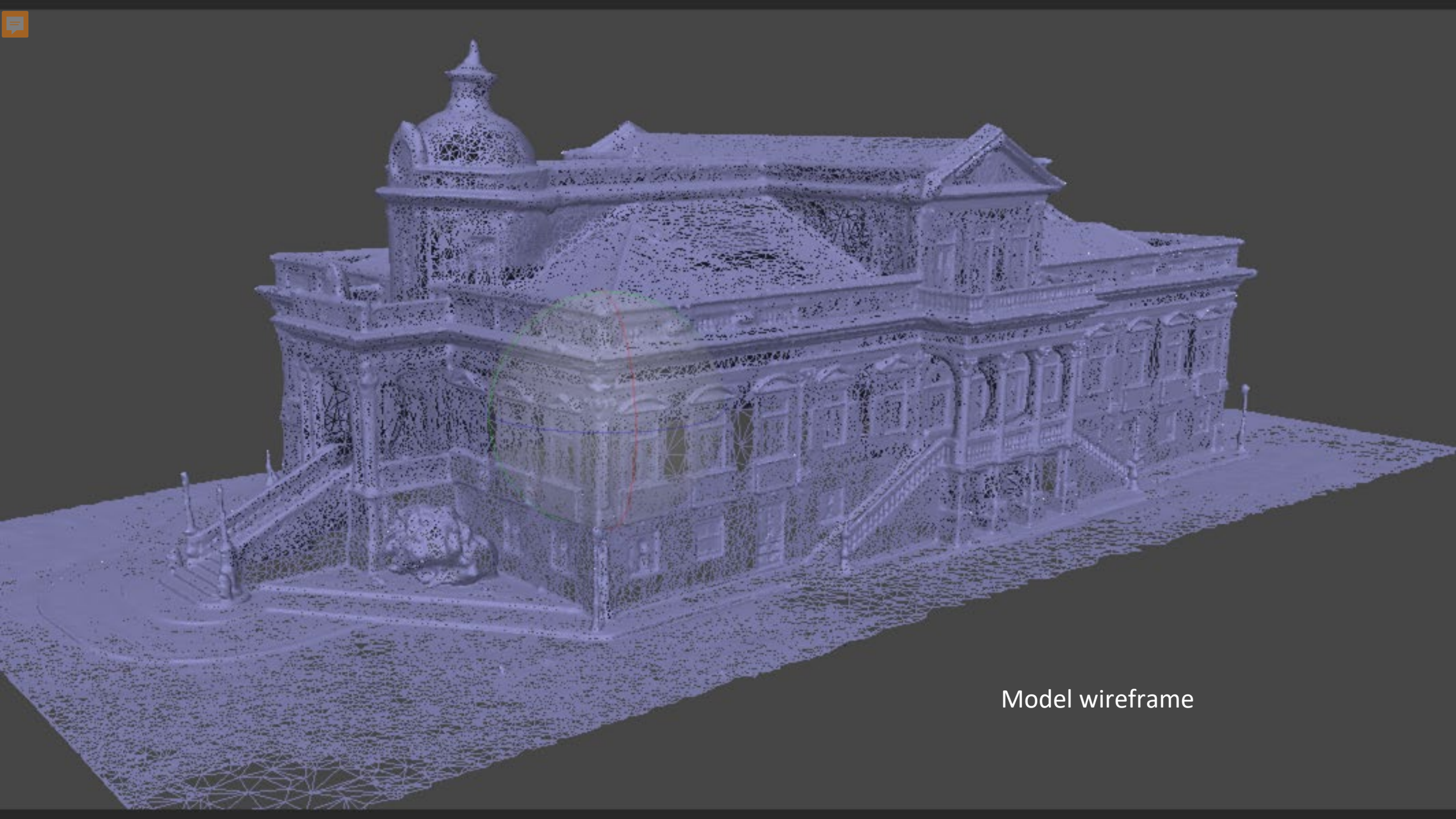## Textured Model

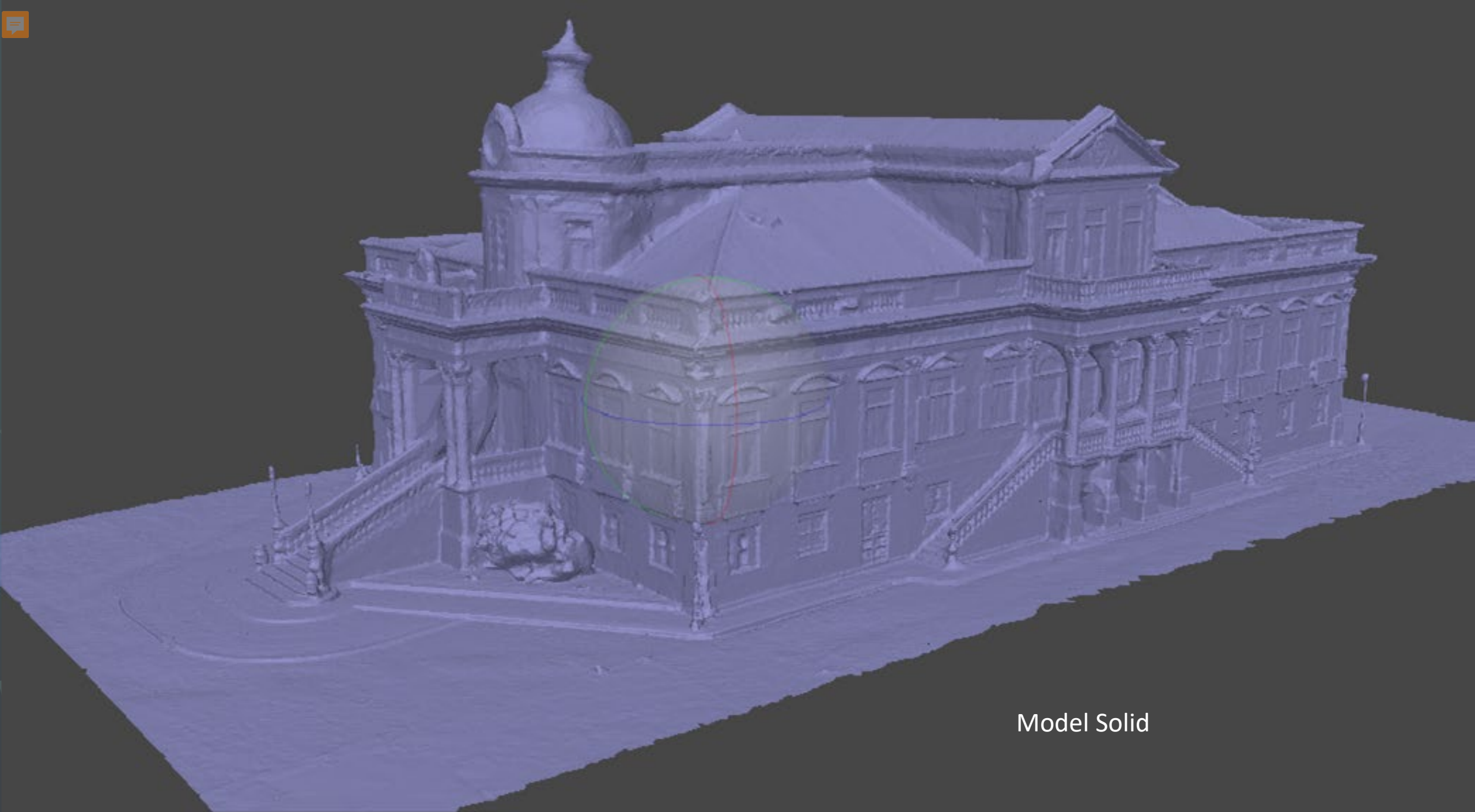Presentation of the best result with Mavic Air 2 in Metashape software:

Dense cloud of points

Model wireframe

Model Solid

The final result of the three-dimensional models generated from the historic construction had to adjust their mesh to be printed on a 3D Fused Deposition Modeling (FDM) printer.