

Laboratório VISGRAF

Instituto de Matemática Pura e Aplicada

Aerial Models Dataset

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Technical Report TR-20-03 Relatório Técnico

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Aerial models Dataset

VISGRAF Lab photogrammetry dataset

IMPA's Building

MAST Campus

Vale dos Cristais

BOC 60

Recreating IMPA's Building

The IMPA's building, as well as the campus area, is part of IMPA itself.

A note from [IMPA's history](#):

The Instituto de Matemática Pura e Aplicada (IMPA) was the first research unit to be established by the Brazilian National Research Council – CNPq, presently the Brazilian Council for the Development of Science and Technology, just one year after CNPq itself was founded in 1951, becoming the foremost agency to promote and support research in Brazil.

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A fundamental factor in the consolidation of IMPA was the construction of its own headquarters in Horto Florestal, Jardim Botânico, inaugurated in July 1981.

The natural surrounding blends with the architecture landmark in an organic fashion. From inside the classrooms or the research labs, a quick glance outside reveals part of the Atlantic forest. The same forest that was once the largest urban forest in the world.

This project intended to provide a virtual record of the experience one may have once entering the campus.

In order to reconstruct the building, we used a DJI-Phantom 2 drone to fly over the site. The flight plan and picture capturing was automated by Pix4Dmapper Capture App, a 3rd party iPhone app. The pictures were imported into Agisoft PhotoScan Pro and the 3D-model was generated there from the captured point-cloud data.

Once we had the 3D model fully-generated, it was easy to fit it into a traditional animation pipeline. We used the software [Blender 3D](#) to produce a fly-over video of the campus.

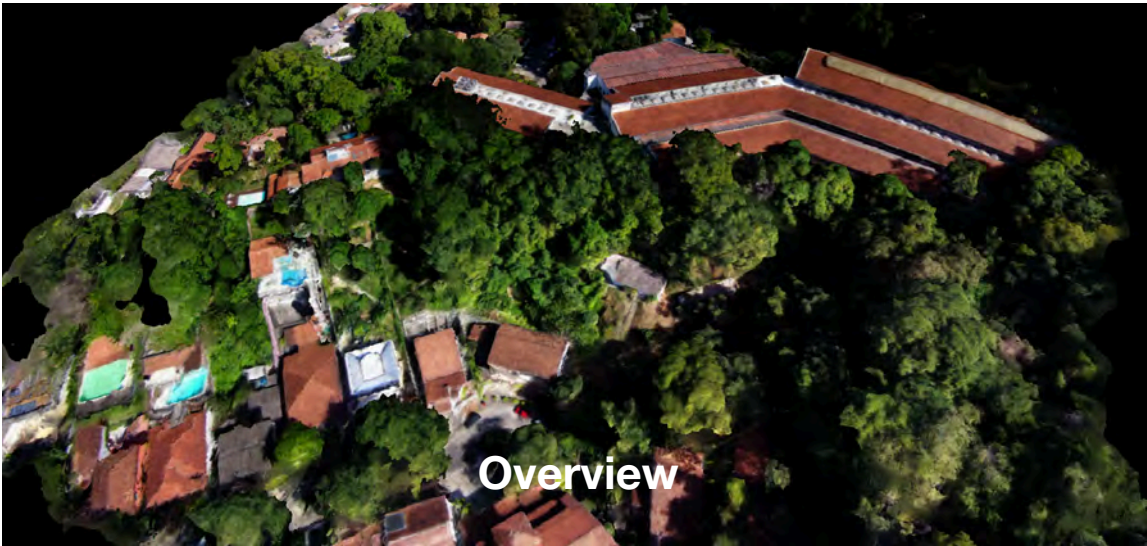
Technical Sheet:

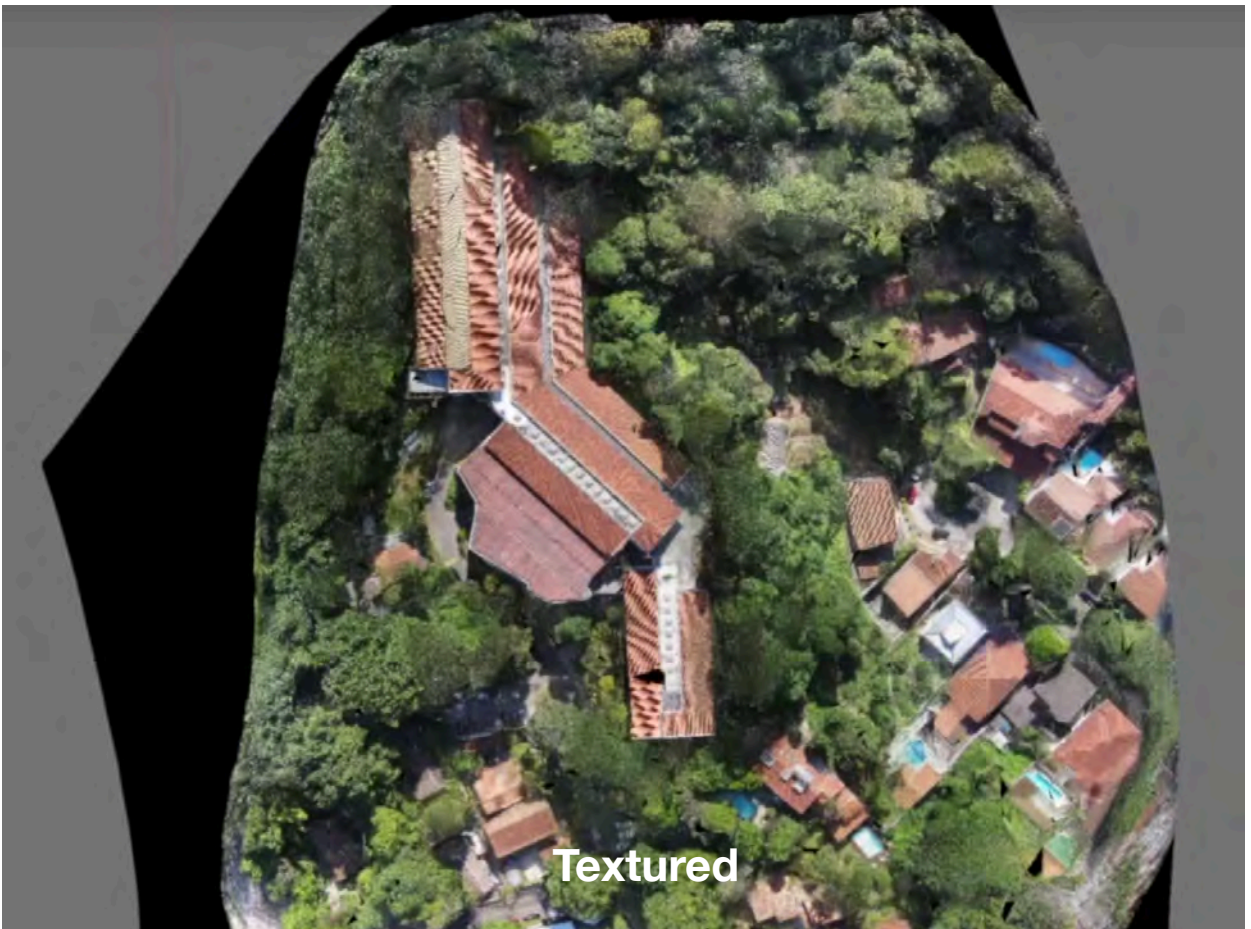
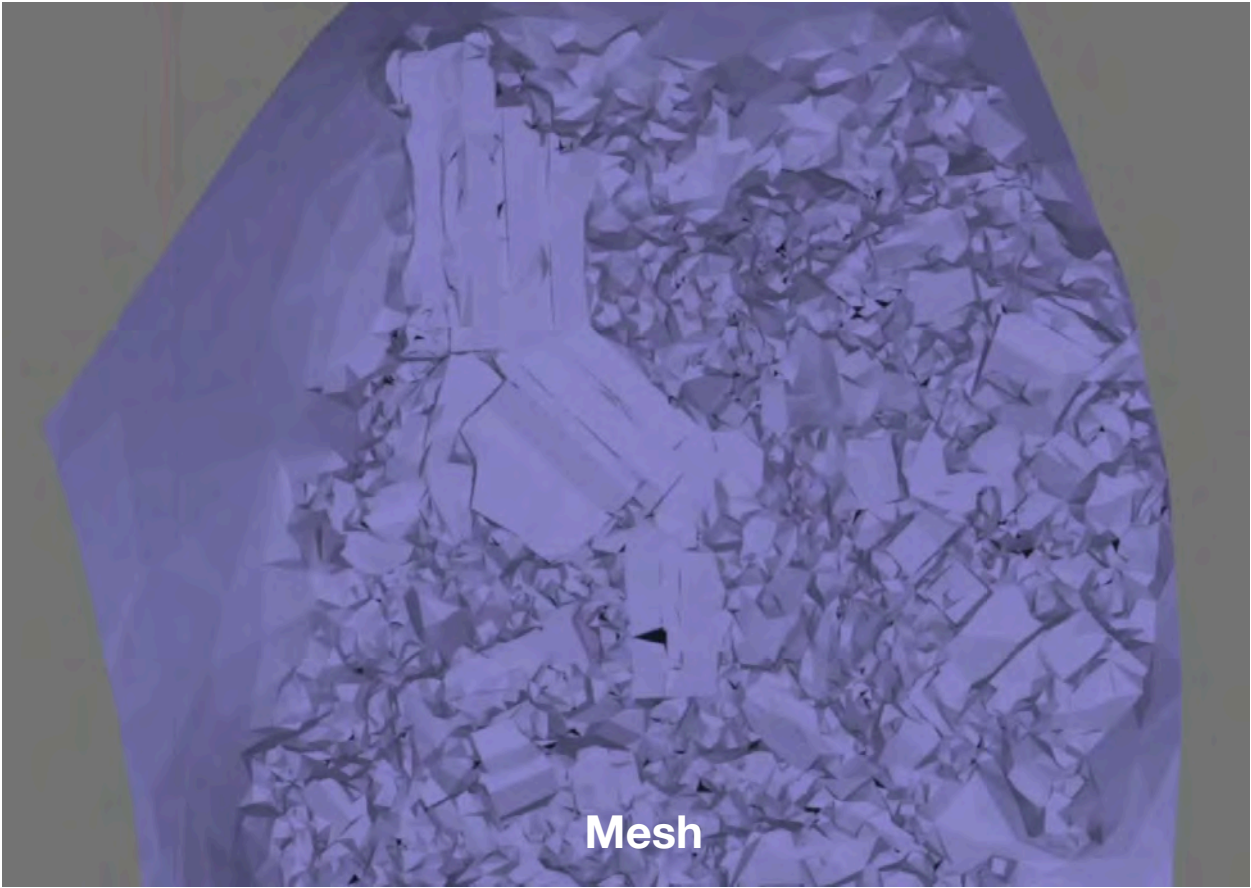
Direction: Luiz Velho

Research: Dalai Felinto, Luiz Velho, Djalma Lucio

Video Editing: Juliano Kestenberg

Project Period: June-August, 2015







Detail



Front

Mast Campus

Reconstruction from aerial photos of the MAST Campus - The Museum of Astronomy and Related Sciences.

This historic building, rising above the ill-kept neighbourhood of São Cristóvão in Rio de Janeiro's marginalised North Zone, houses a research institute and museum dedicated to the study of the skies known as the Museu de Astronomia e Ciências Afins (MAST). The building was built between 1913-1921, originally as a new home for the National Observatory.

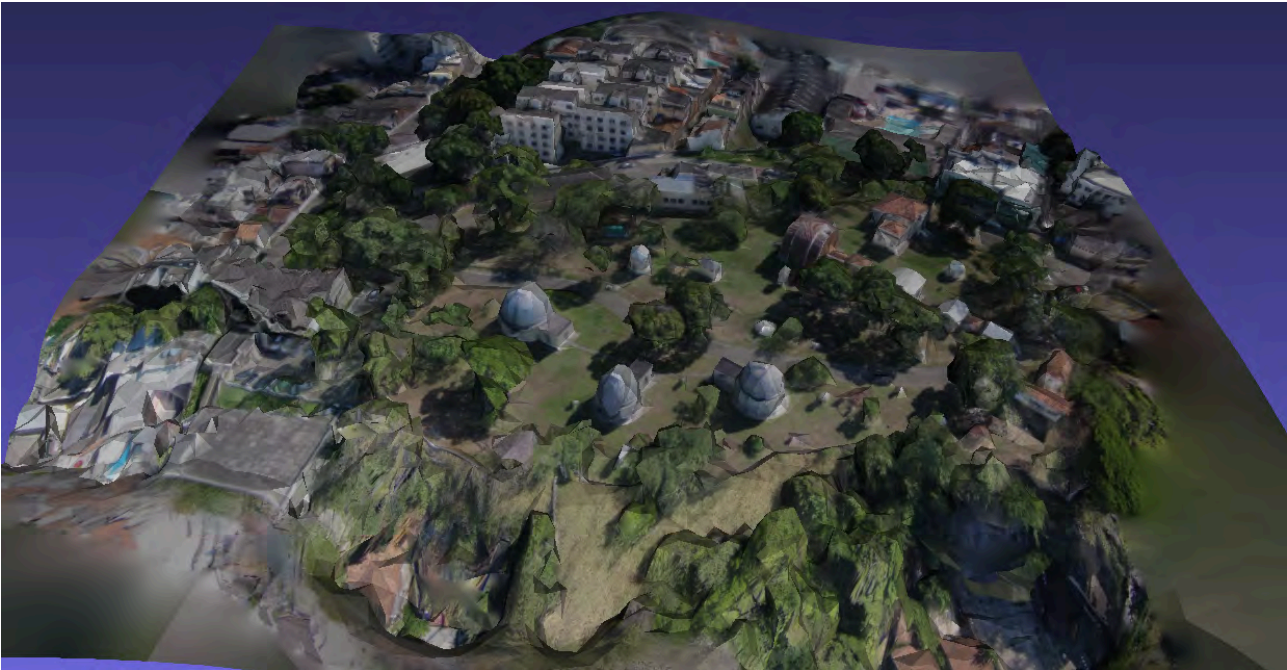
Technical Data:

Equipment: DJI Phantom 2 drone

Software: Agisoft PhotoScan



Total Area



Telescopes Park



Building Area



Main Telescope Dome



Vale dos Cristais

Flight Path



Overview



BOC 60

BOC 60 is the new IMPA (Pure and Applied Mathematics Institute) campus to be erected at 60 Barão de Oliveira Castro Street, in the Jardim Botânico, in the south of Rio de Janeiro.

The land, 251,824.72m², was donated to IMPA by the Marinho family. Andrade Morettin Associated Architects is responsible for the architectural project.

The building area will have 8,140.30m² and includes auditoriums, offices for researchers and students, a library, classrooms and dormitories.

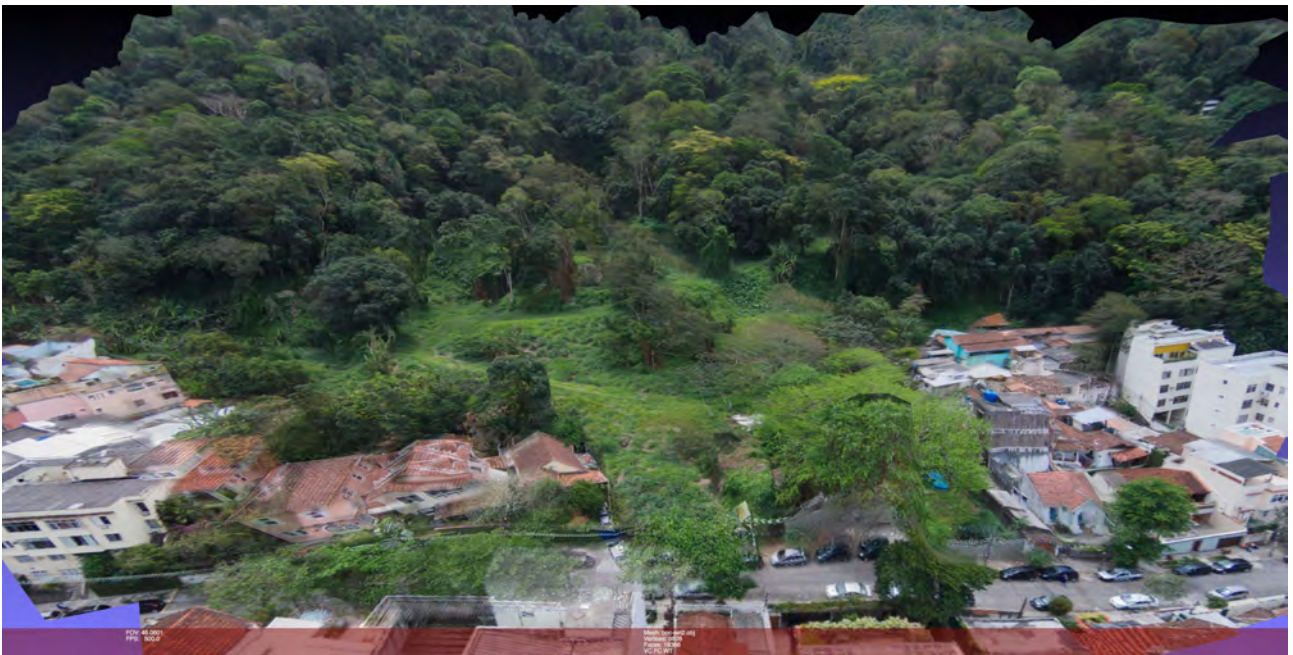
The IMPA expansion architectural project received the 2017 Recognition Award from the Lafarge Holcim Foundation for Architecture, for minimizing the impact of the work on the forest and urban surroundings and for the climate modulation of the projected buildings.

3D Reconstruction

We plan to document the development of the new IMPA's campus by a periodic aerial surveillance of the area during the construction. At each step, a photometric 3D reconstruction will be performed to create an evolving digital model of the site.



Overview of the Area



First Surveillance

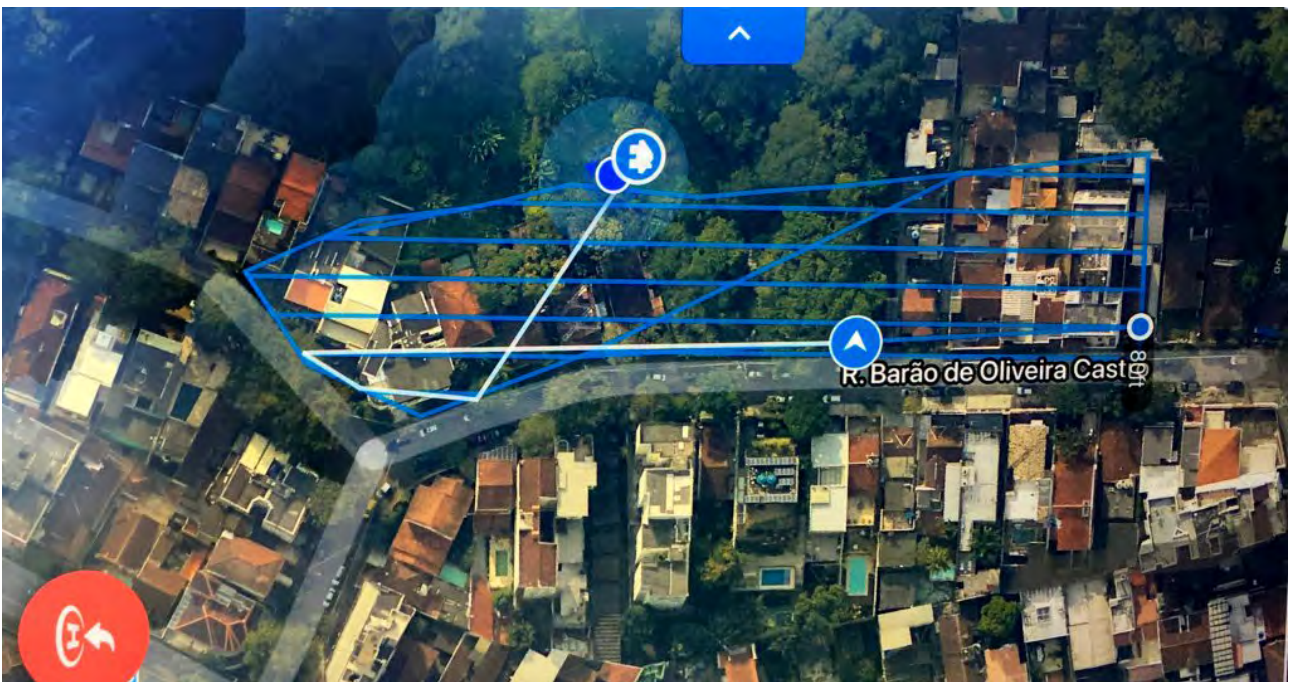
In the first surveillance of the area, we acquire data at three different levels of detail: low (high altitude), medium (moderate altitude) and high (low altitude)

Photos



Flight Paths

Below are the flight paths for the data capture:



Views





Comparison of Reconstruction Software



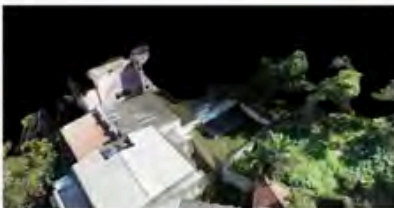
Pix4d



Metashape



Open Drone Map



Pix4d



Metashape



Open Drone Map



Pix4d



Metashape



Open Drone Map



Pix4d



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