

**3D scanning
with the drone**

PHANTOM 2 VISION



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The Guatemalan ceibas from South Coast of Guatemala, are about 60-70 meters tall and with many branches with leaves densely populated in its canopy. By studying them we realized the need to use a drone to obtain a clear 3D scan of the tree with all of his branches and leaves.



Picture from www.dji.com

The drone DJI PHANTOM 2 VISION of Juan Carlos Fernandez of the brand Dji was though a good solution to get this full 3D scan of the ceiba. You can find it in <http://www.dji.com>.

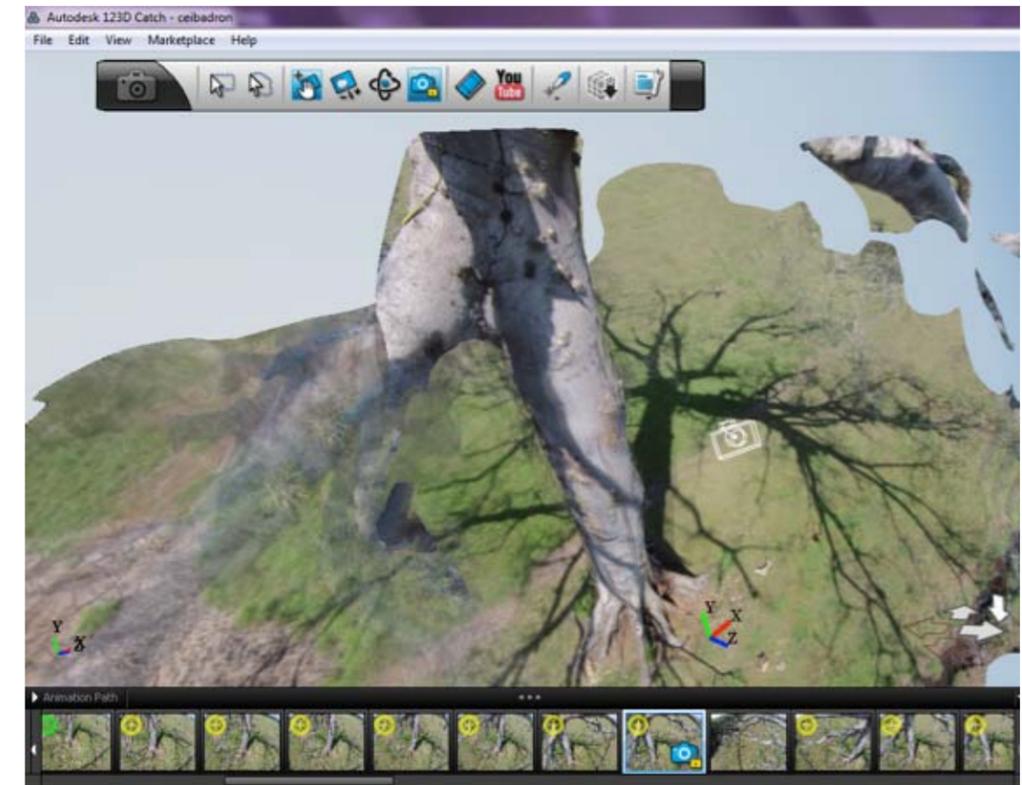
The drone is equipped with a camera DJI phantom 2 vision model, 14 Megapixels, and is exactly the same as the photo below. It also has a built-in support anti-vibration using four soft rubber plugs.

Around 70 photos, 40 in the top of the ceiba, 30 front were used. The greatest height obtained was about twenty meters and the lowest was a meter away.

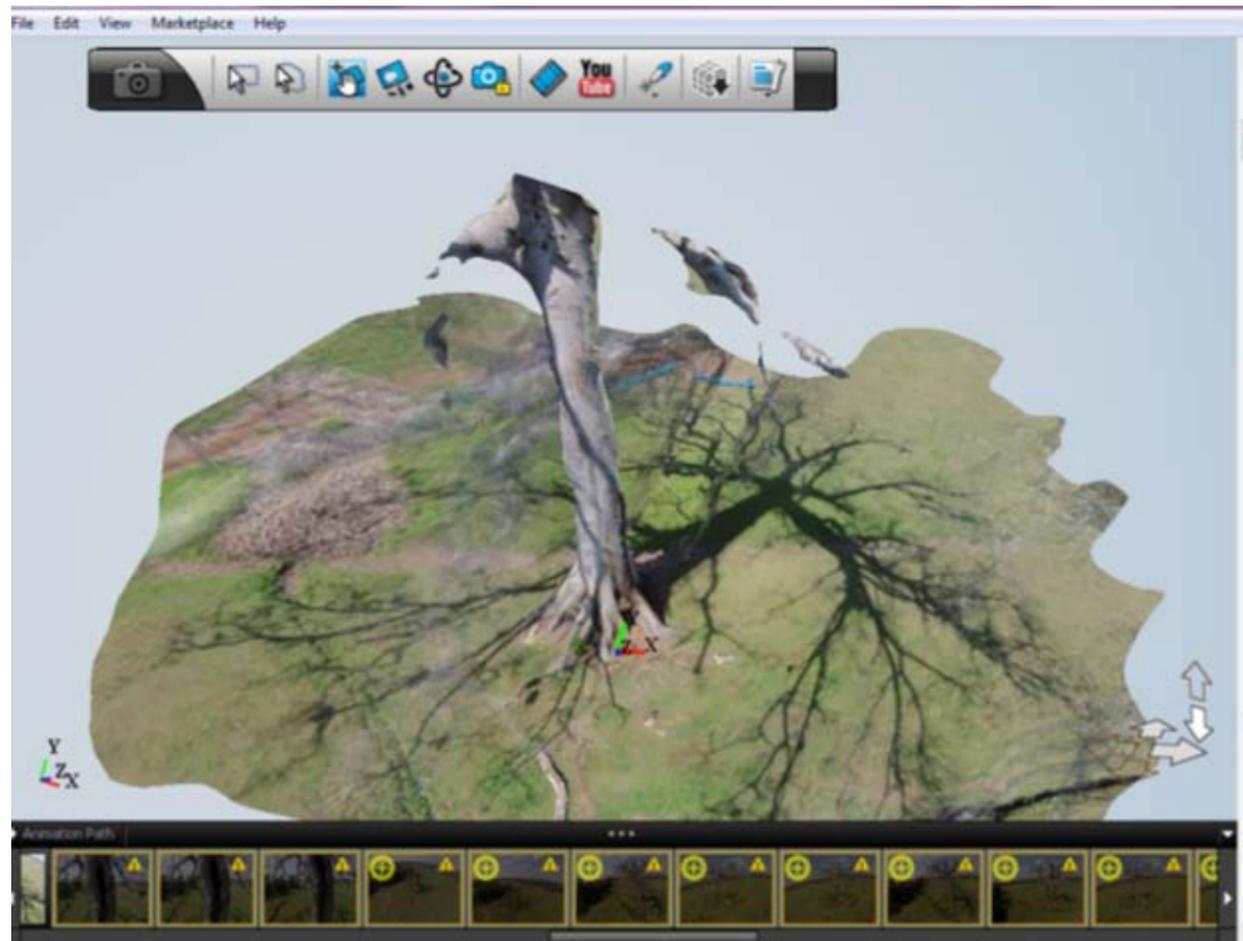
We got some fish eye distortions from the lens, but we try with them as best we can.



This a picture from our Dron, with 3 meter of diameter.



After uploading these photos in Autodesk 123D Catch, we got this bad result. The result obtained in the scanning software was a ceiba with no defined top and some blurry parts. The fisheye distortion in the banks was probably what caused the top not to be obtained in the 3D render.



After this we tried again in Autodesk 123Dcatch, but the result were bad again. No leaves and no branches appeared.

There is a lens in Adobe Photoshop for the drone DJI Phantom 2 removes the distortion.
 Download the lens here:
http://download.dji-innovations.com/downloads/phantom-2-vision/en/PHANTOM_VISION_FC200_Files_and_Instruction_en.zip

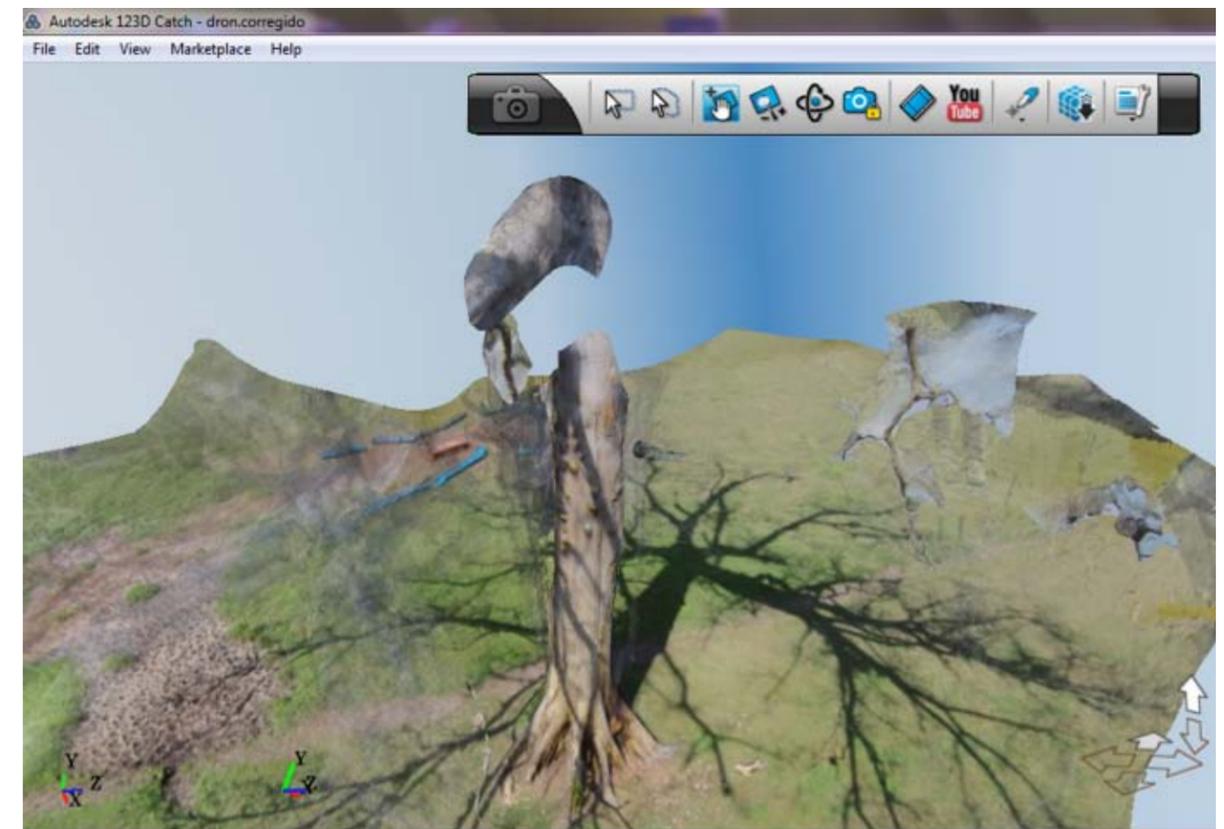
Copy the file Phantom VISION FC200.lcp at the following location on your computer.

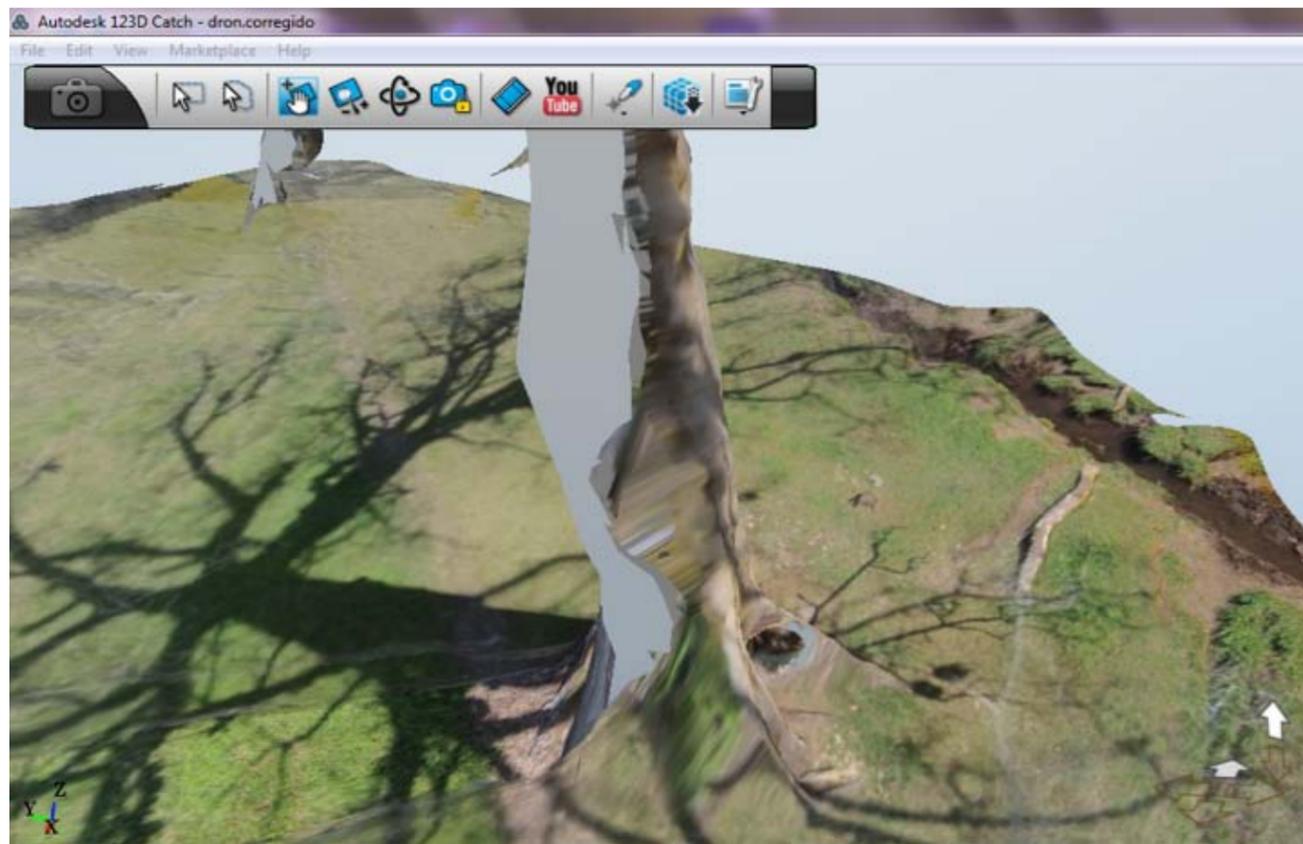
For Mac localize,
 / Users / [username] / Library / Application Support / Adobe / CameraRaw / LensProfiles / 1.0 /

Windows localize,
 C: \ ProgramData \ Adobe \ CameraRaw \ LensProfiles \ 1.0 3. Open Photoshop, select Filter.

Once copied the file open Photoshop and follow the instructions in this tutorial
www.youtube.com/watch?v=fbiKe86qbLA

The arrangement of the photos you get is pretty good, which encouraged us to try again with the 3D scanning software.





In conclusion, Autodesk 123d catch is not good for 3d scans with drones especially for little parts like leaves.

We will continue to search for a software to handle small features (tree leaves), and we will suggest a larger drone to enable us to avoid the distortion of go - pro lenses - cameras. GoPro is great for bikers and hikers, but the cheap models are totally inappropriate for scientific research.

We will seek funding to use a real camera with a real lens: for realistic results. 99% of beginners start with GoPro or similar. This is good practice to learn how to fly drones, but beside that is a waste of money. Great for family fun or trial and error, but it acceptable for 3D scanning of Ceiba Petandra tree.

