

Creating and Editing 3D scanned objects

Using the Display.land application


Display.land is a free iPhone based 3D object scanner app that can take a scan of a physical object with its camera and produce a 3D model of the object in Wavefront .obj format complete with its associated material file.

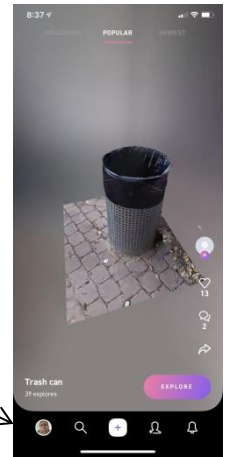
Scanning a real-life object

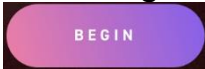


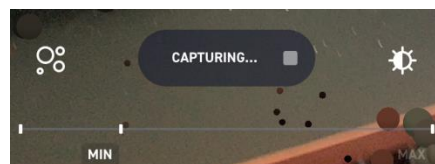
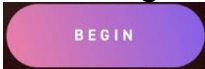
- Begin by launching the app on the iPhone:

You will open to the explore screen where other people's scan videos are being shown. Swipe up or down to see different videos.

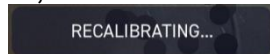
- Tap on your own profile picture (bottom-left) to view a list of your own scan videos
- Tap on the bottom-center plus sign:  to open the scanner window.



The scanner window enables the iPhone camera which will begin recording the video and gathering image data when you press the  button at the bottom. It will show that it is.....

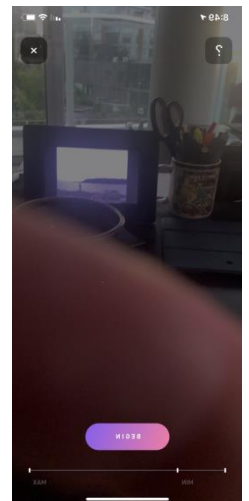


As the capturing begins, set the best lighting by tapping here. It will then show that it is...

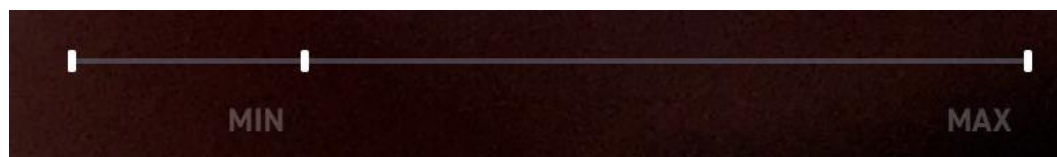


It is best to point the camera to a single point and make many slow rotations around the subject. (hold the phone steady!)

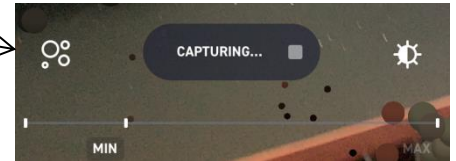
- As you do, little dots will appear on the image to indicate data points being recorded.
- Point higher and lower, further away and closer and keep slowly rotating around the object at slightly different camera angles until the progress bar at the bottom goes past MIN. Then go a bit further; past the MIN. The more points collected, the better the final result will be.



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- You can preview a “minimap” of the object while in the capturing process by tapping the minimap icon on the left.

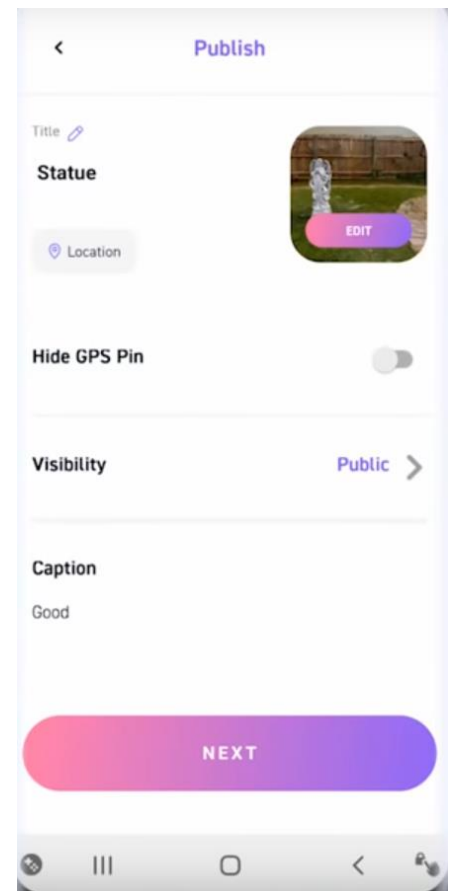


- Once a minimum of required data points have been scanned, a MIN indicator highlights under the progress bar. Go a bit past the minimum and then press the X Stop button at the upper right:
- Once you press the stop button, you will be brought to a “Create” screen where you can give the object a title.
- Then you will be shown the UPLOAD NOW button. This screen allows you to upload later and shows an estimate of the amount of data that will be uploaded.
- When you press **Upload Now** the upload begins. (must be on Wifi) (leave app open while uploading)



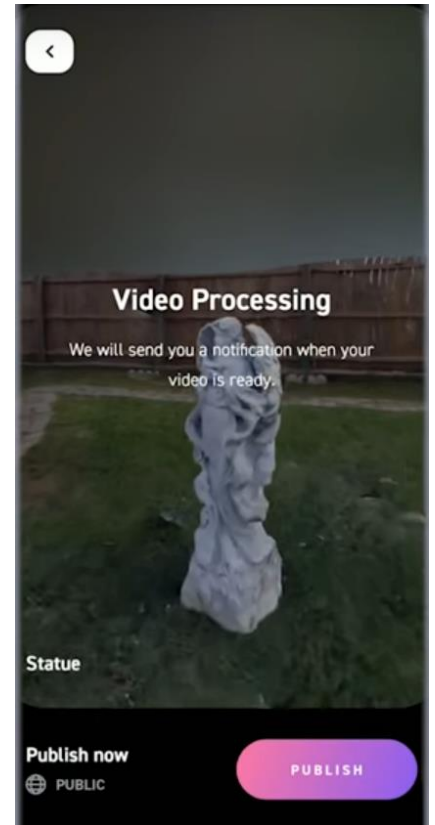
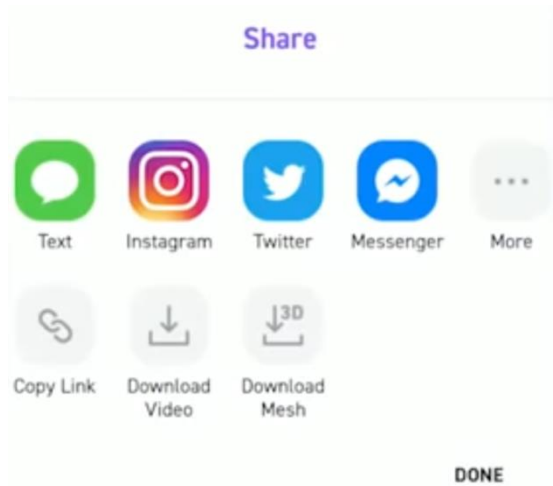
- When the upload is done, the Processing on the web begins automatically. (Depending on the size of the capture, this could take a few minutes to a few hours.)
- Once the processing is done you will see the Publish screen. Here you can:

- o Give the model a title,
- o State the location
- o Hide or show the GPS data of where the video was taken
- o Set whether the model will be Public or Private
- o Give the model video a caption
- Or edit the scan to create a cleaner model video; tap the EDIT image to start.
 - You can crop the image of the scan,
 - Or insert some fun objects into the image.
 - Add some notes to the video
 - Create a video trailer.
 - Tap the checkmark to end editing
- When you're done, press Next to publish the model in a number of 3D model formats



While the video is processing the screen informs you that you will get a notification when it is done

Once the video processing is done, you are notified on your phone and a link is sent to your email. Now you see a **Share** screen. Here is how you access the 3D mesh



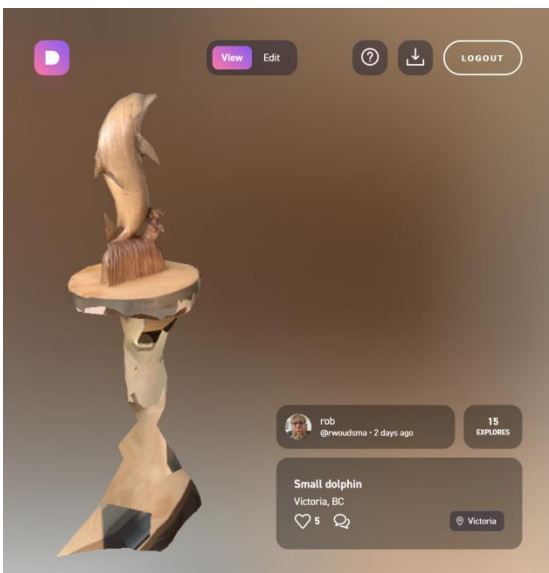
You could download the video or mesh to the phone but it'd probably be best to share the download link for the mesh to yourself by email.

- Press More and find Outlook. Tap Outlook to send
- Enter your own email and send (with subject or not)
- When you receive the email, open it:
- You can further View/Edit or.....



"Small dolphin" by @rwoudsma
<https://displayland.app.link/fEoUpZkuY6>

Sent by Rob Woudsma



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,,,,,,download the mesh:



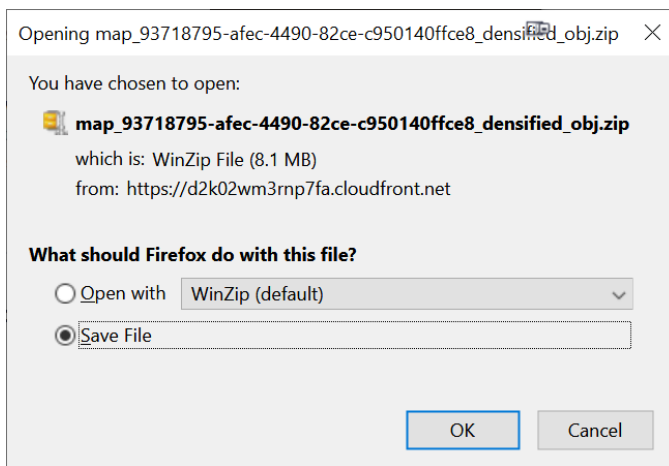
When you press the **Download** button the screen changes to offer four options:

The GLTF and OBJ are actual 3D mesh files that can be imported into Blender (both) or Vue (OBJ).

The download happens very quickly as the files have already been produced in the Processing stage.

➤ Click on the **OBJ 3D Mesh** download

A standard download screen opens to ask where to save the download file:

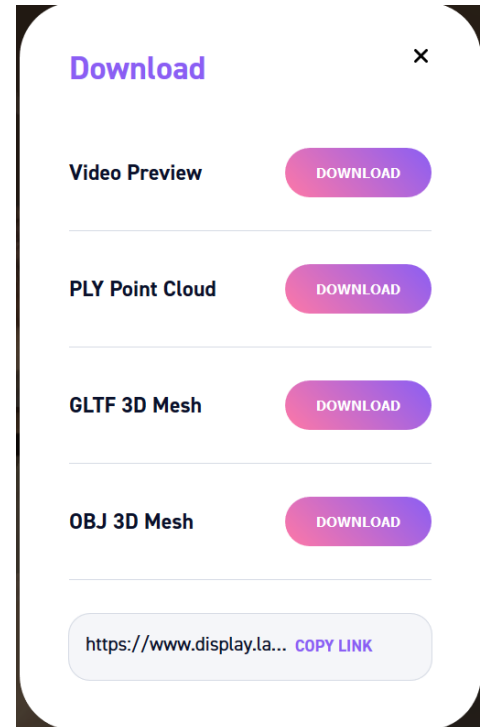


➤ Click the **Save File** option and press **OK**

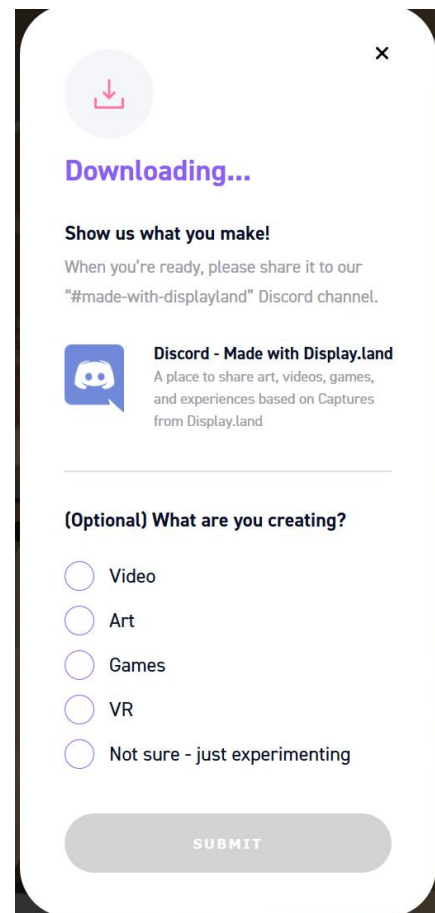
➤ In the Downloads folder, you will find the OBJ 3D Mesh files as a .zip file.

➤ Unzip this to the Displayland folder

You will see the .OBJ mesh file, a (useless) .mtl material file and a 4K x 4K colour-map ,jpg file.

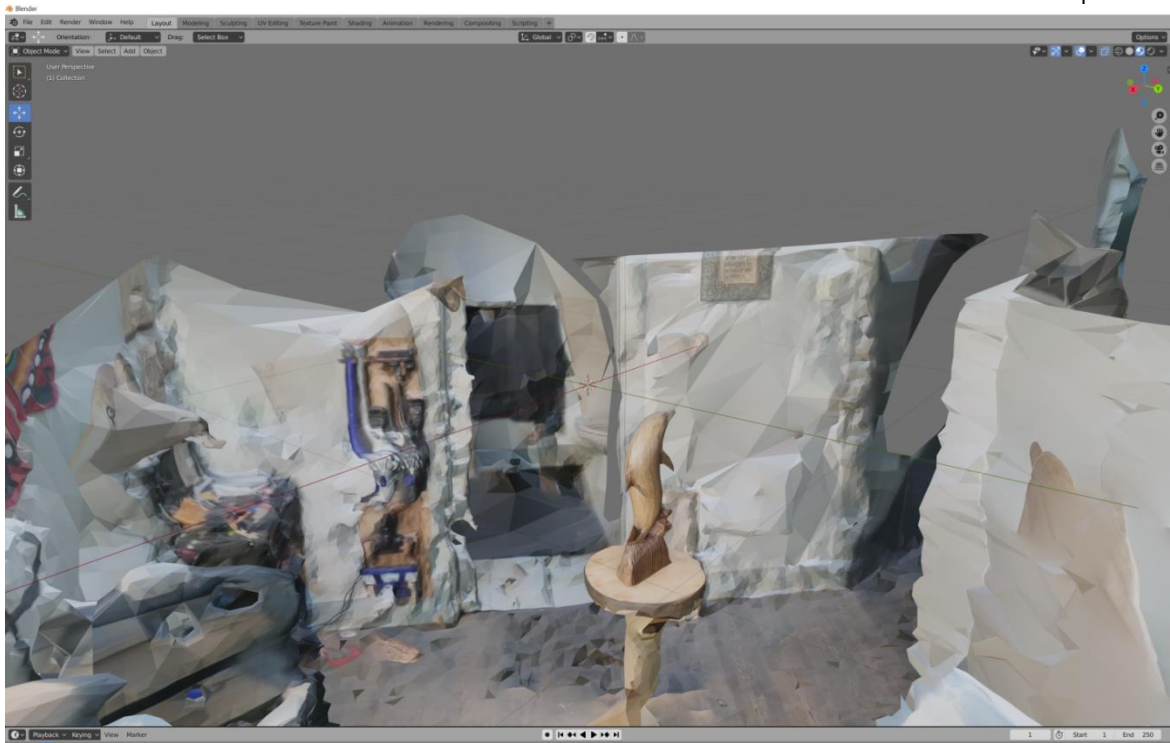


...and a feedback screen asks for some info.






A: Loading the scanned model Into Blender: (OBJ or GLTF file)

- Open Blender
- Delete the default cube (X)
- Select File / Import / Wavefront (.obj)
- Select the .obj file only (not sure if we need the .mtl file)
- Once loaded, click on **Material Preview**:
.....to see the original colours.



Isolating the dolphin from the rest of the scene in Blender

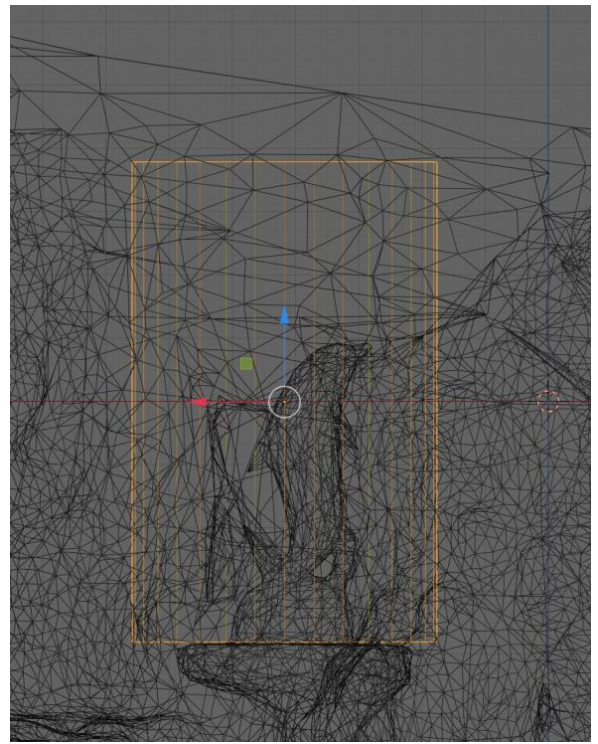
- Go to top (Z) view 
- Add a cylinder using Add/Mesh/Cylinder.
- this will place a cylinder mesh into the scene which we will use to surround the part of the scene we want to keep as the rest is deleted.
- Set the **Scale** tool  and the **Move** tool  to change the diameter, the length and the position of the cylinder so that it covers the dolphin and its base but not the pedestal that it is on.

NOTE: to best see the scene, the dolphin and the cylinder, it is best to change the main view to X-ray and also, Wireframe mode




Surround the Dolphin with the Cylinder

- Adjust the cylinder using the **Scale** and **Move** tools to adjust the cylinder.
- Look from the Z, X and Y perspectives to make sure the cylinder is in the right place



Isolating the dolphin from the rest (difference)

- With the cylinder selected, click on the modifier **Properties** tool:  on the right-side toolbar.
 - Click the **Add Modifier** bar at the top of the right-side Modifiers panel
 - In the window shown, select **Boolean** from the generate list.
 - Under **Operation**, select **Difference**
 - Under **Object**, the **Small dolphin scan** should be the only item so select it.
- In the display, just the dolphin should become highlighted and the cylinder will disappear
- Click on Apply.



-In the upper-right browser panel you will see the remaining dolphin is still named: cylinder.

- Click anywhere on the scene (but not on the dolphin) to select the “Small dolphin scan”
- Press X or right click and select delete to remove it.
- The dolphin that had been inside the cylinder will remain but the cylinder will disappear as well.

The vertices of the dolphin can be seen but all colour information is gone.

- To export the model for use in Vue, select file/export/FBX
- Select the folder to place the FX model into. Typically this would be: *D:\Dropbox (main)\dropbox\Vue Content, Extras & Scenes\Importable Objects\FBX Misc models*
- Give the model a name and click **Export FBX**

B: Load the scanned model into Vue

- Open Vue to an empty scene
- Select **File/Import Object...**
- Navigate to the folder: **FBX misc models**
- Load: **Dolphin from OBJ-Diff.fbx**. The Import Options dialog will appear

In the options you can smooth the incoming model and you can downsample any included texture maps (May or may not be there)

The dolphin was imported four times with different settings each time. The results are shown below:

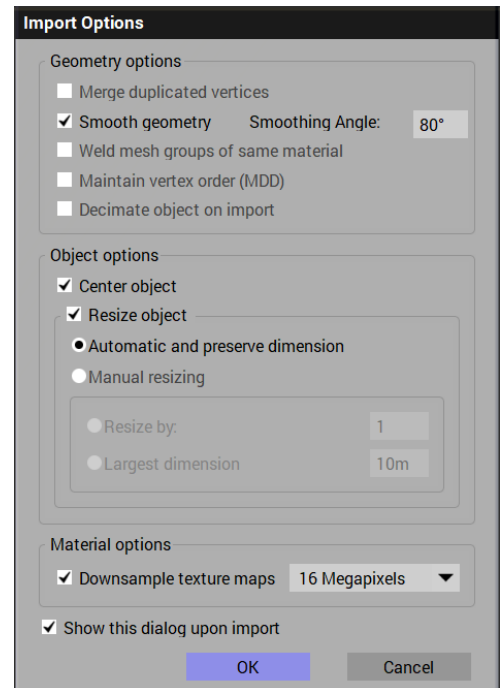
1st: not smoothed no downsample

2nd: smoothed 80% no Downsample

3rd: smoothed 80% & downsampled 16M

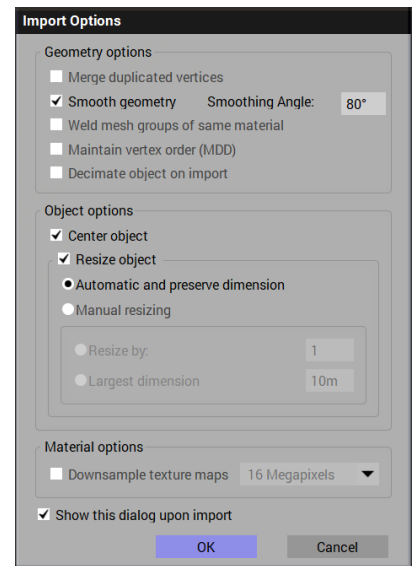
4th: smoothed no downsample Wood material applied. (.02)

Looks like smoothed @80° and no downsample but some Vue material applied works best.

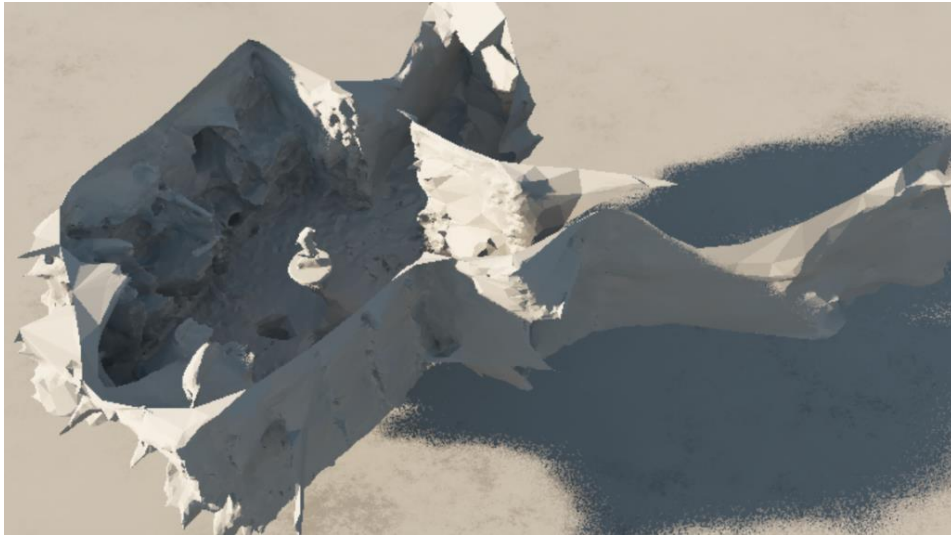


Isolating the dolphin from the rest of the scene in Vue

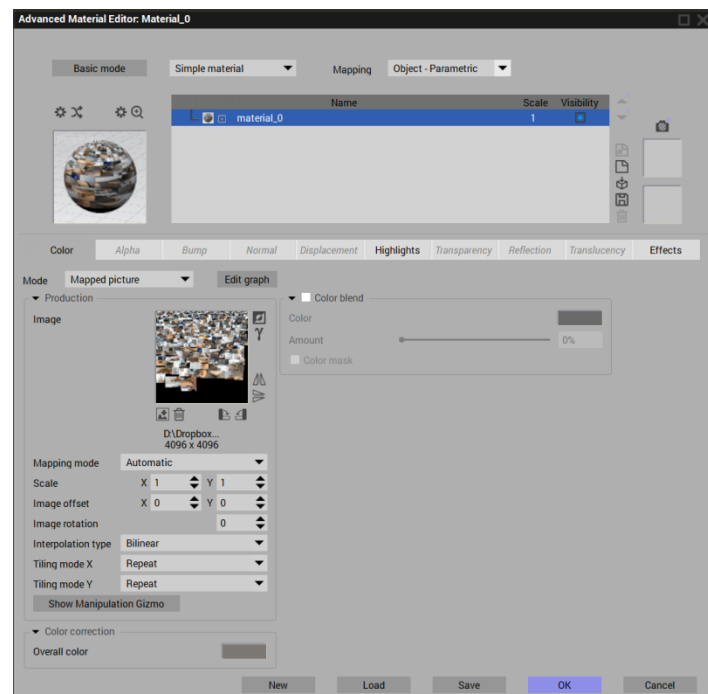
- Open Vue to an empty scene
- Select File / import object
- Navigate to the appropriate directory and select the .obj file.
- When the **Import Options** dialog shows, set **Smooth Geometry** on and **Smoothing Angle** to 80° (**Downsample** not needed, so leave it off)



The full scan of the dolphin and entire room is loaded.


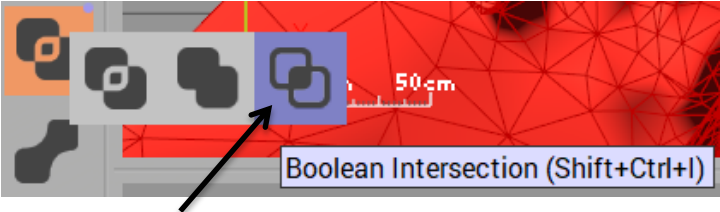


- To add the original colours to the scene, make sure the **Small dolphin scan** object is selected and double-click the **Object-Aspect** sphere to open the **Advanced Material Editor**.
- On the **Color** tab, change the **Mode** to **Mapped picture** and load the .jpg picture that was produced by the Display.land app.
- For the **Mapping**, **Object Standard** or **Object Parametric** should both be correct.
- In the **Production** panel, the Mapping mode should be the default; Automatic. The Interpolation type, the default; Bilinear and the X and Y Tiling mode: the default; Repeat.





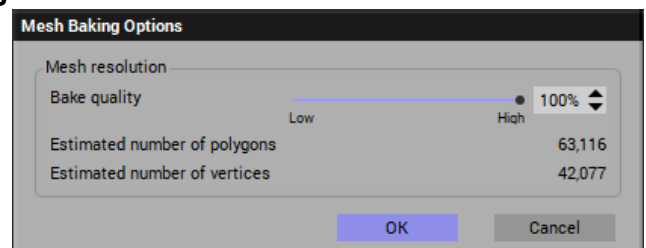
The colour will be applied to the scanned object as shown here:

- Add a cylinder object to the scene 
- Use the object grips in the various X,Y and Z views to size and move the cylinder to just cover the dolphin but not the pedestal
 - ❖ You may need to place the camera right inside the room (Vue doesn't have an x-ray mode) and at the appropriate level to see the placement of the cylinder relative to the dolphin.
 - ❖ If you select the dolphin scene, then Ctrl-select the cylinder, you will see the wire-frame view of both of them.
- Once the cylinder properly encloses the dolphin, select the dolphin scan object first, then Ctrl-click the cylinder to select both of them.
- From the Boolean icons select the Boolean Intersection (might need to right-click to see it) or select:
 - Object/Create Boolean**
 - Object/Boolean Intersection**
 from menu at the top.
 

- The part of the dolphin object that intersects with the cylinder object will remain as the rest of both objects are removed (at least in the X, Y and Z views.)
- If you click on the resulting "Intersection" object in the **World Browser**, you will see that the two parts that made up the intersection still exist.

- To make the Intersection independent of the two parts, right-click the **Intersection** item in **World Browser** and select: **Bake to Polygons** from the list.

- The **Mesh Baking Options** dialog appears.
- Set the **Bake quality** to 100% (usually) and note the estimated number of polygons and vertices that will result.
- Click on **OK**.



The colour map of the dolphin will be lost but any material can be applied to it. The remaining "Intersection" can now be renamed and saved in the same way as any .vob object.

Final image of scanned dolphin statue in Vue Pro with wood material applied.

