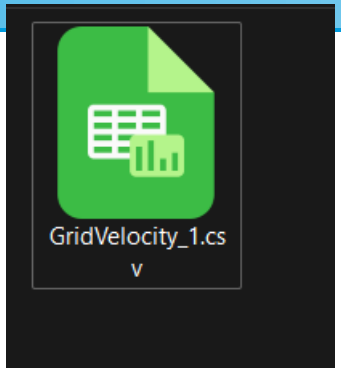
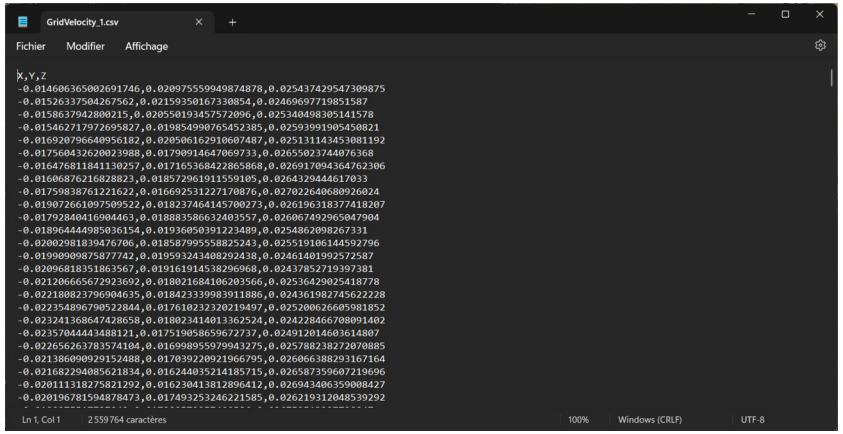
How to mesh a .csv file

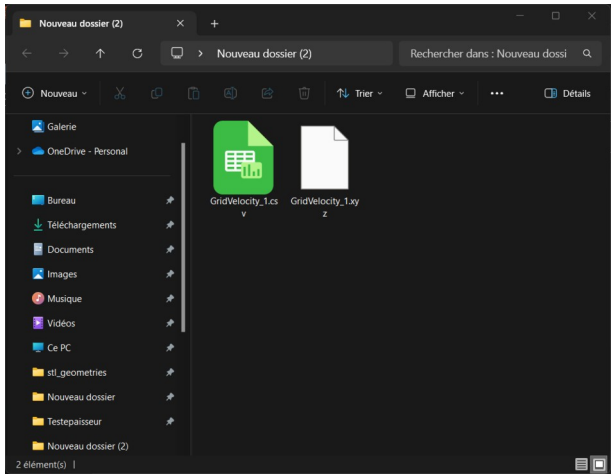
- Select a .csv files.
- Open it with notepad.



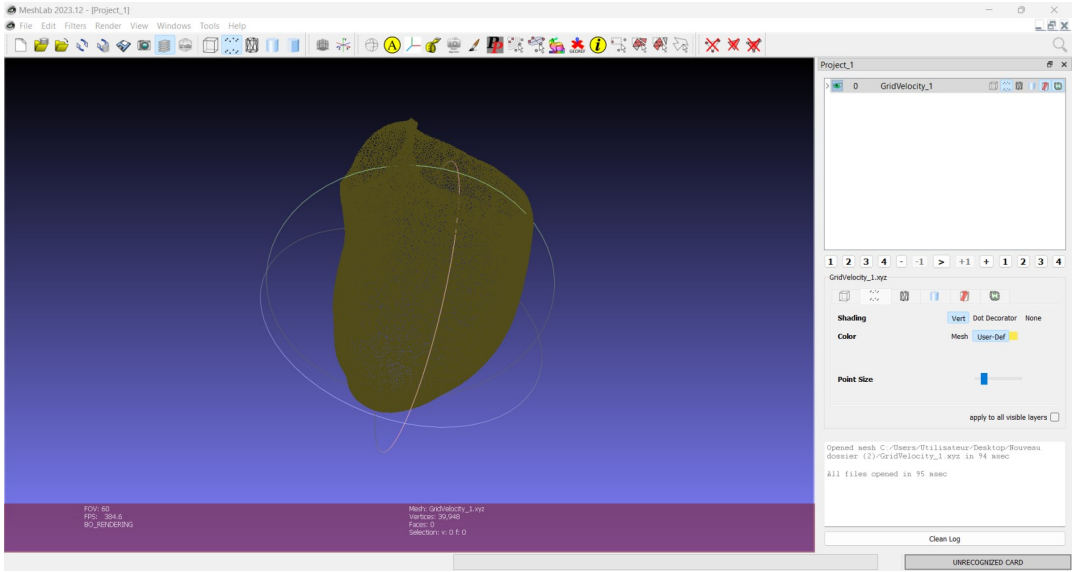
- Delete the first line
  (the one with « X,Y,Z »)
- Modify → replace
- Replace all the « , » with « »



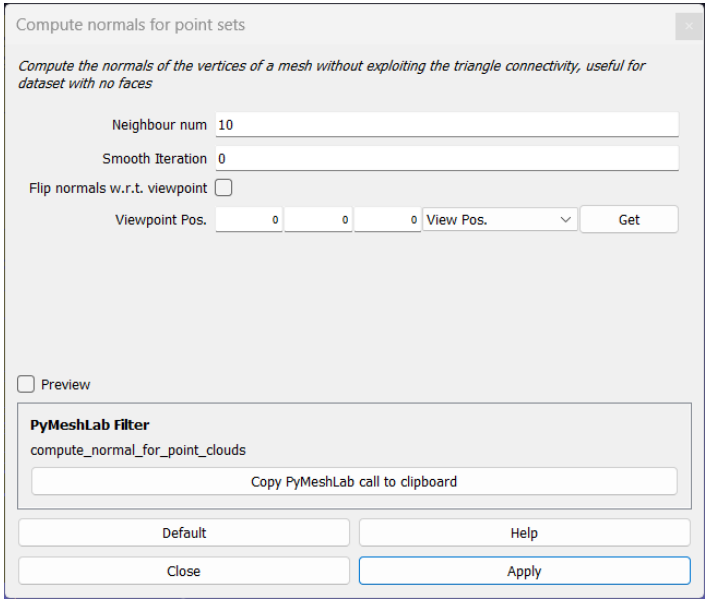
- File → save as : Save the new file with the « .xyz » extention.



- Go into Meshlab
- File → import mesh
- Choose the «.xyz » file

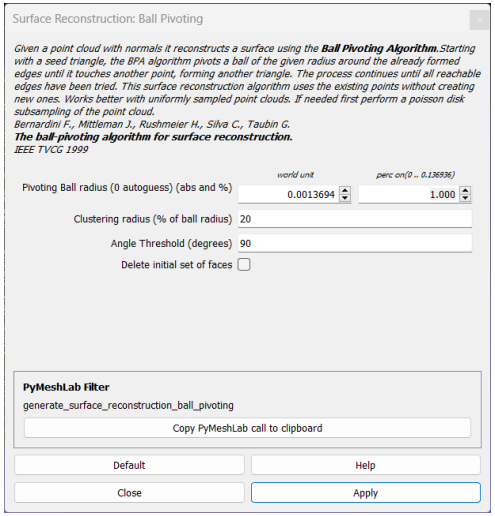


- Filter → Normals, Curvatures and Orientation →Compute normal for set points
- Apply

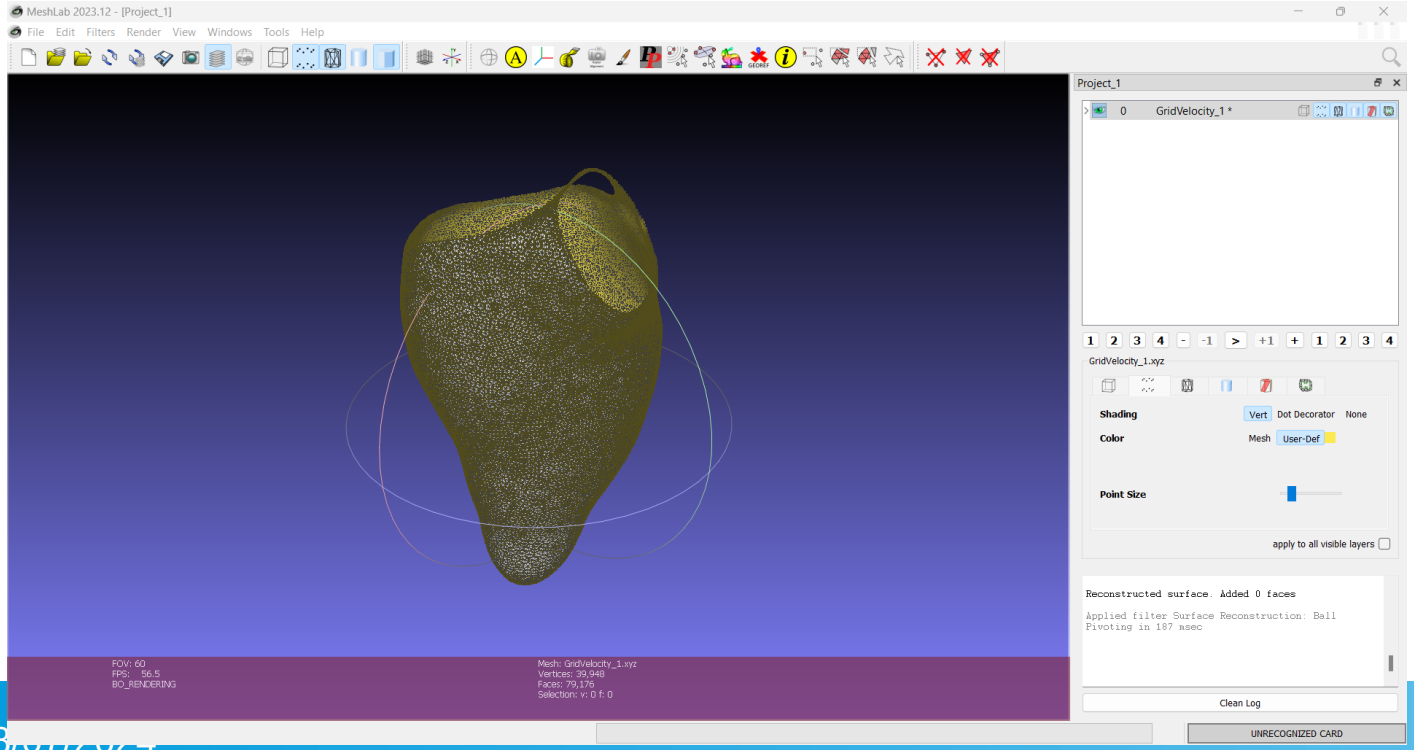


- You can do smoothing at this point or anytime after, it’s optional however.
- Filter → Remeshing, Simplification and Reconstruction → Surface Reconstruction : Ball Pivoting

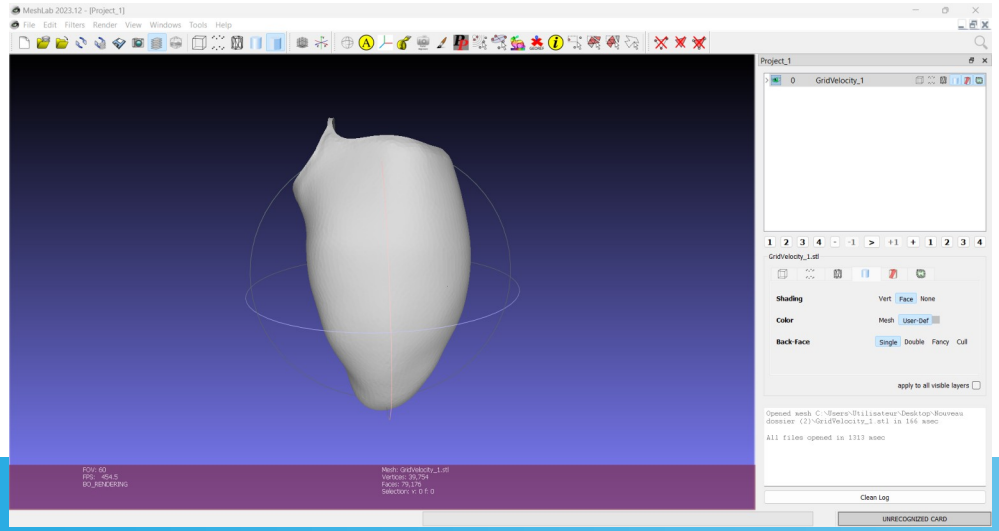
- You want to change the « pivoting Ball radius » from 0 to 1 % (modify on the right).



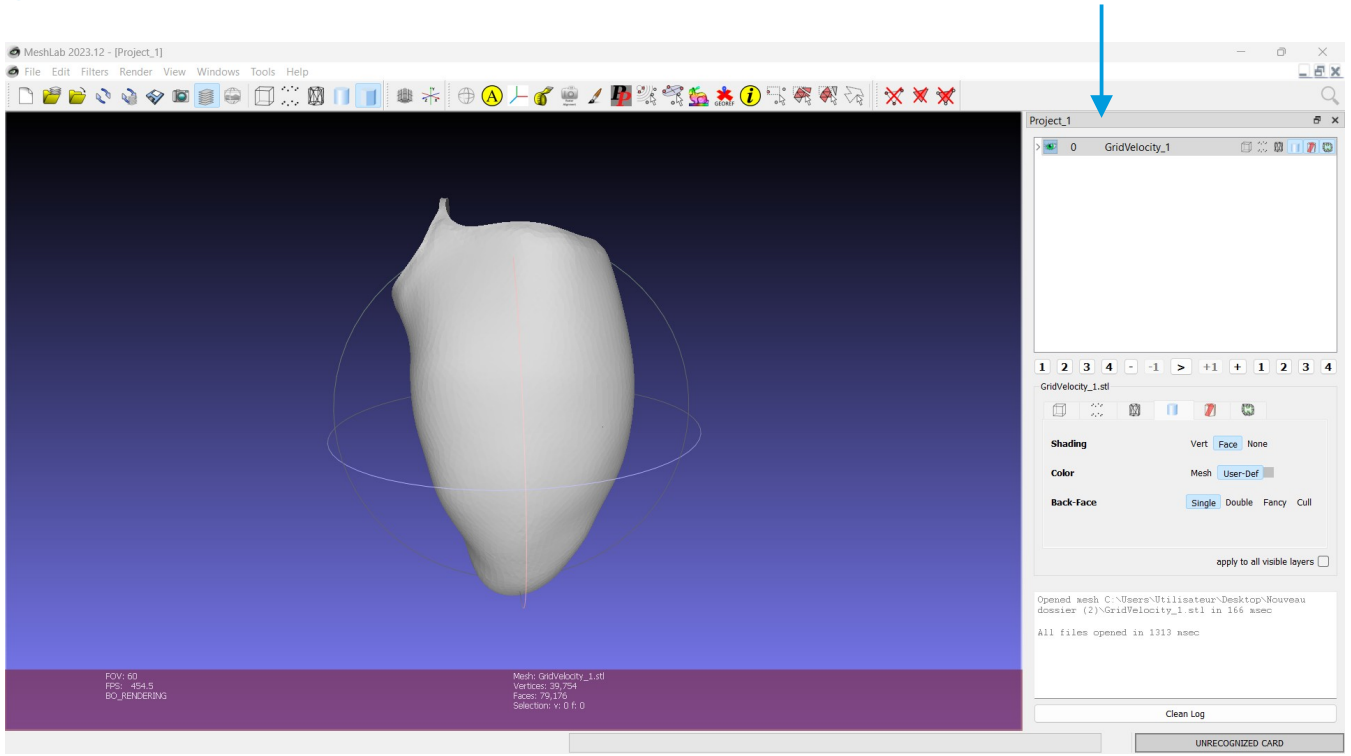
- If the ball radius is too small, you will have holes in your surface, if it’s too big you will close all the valves of the heart.



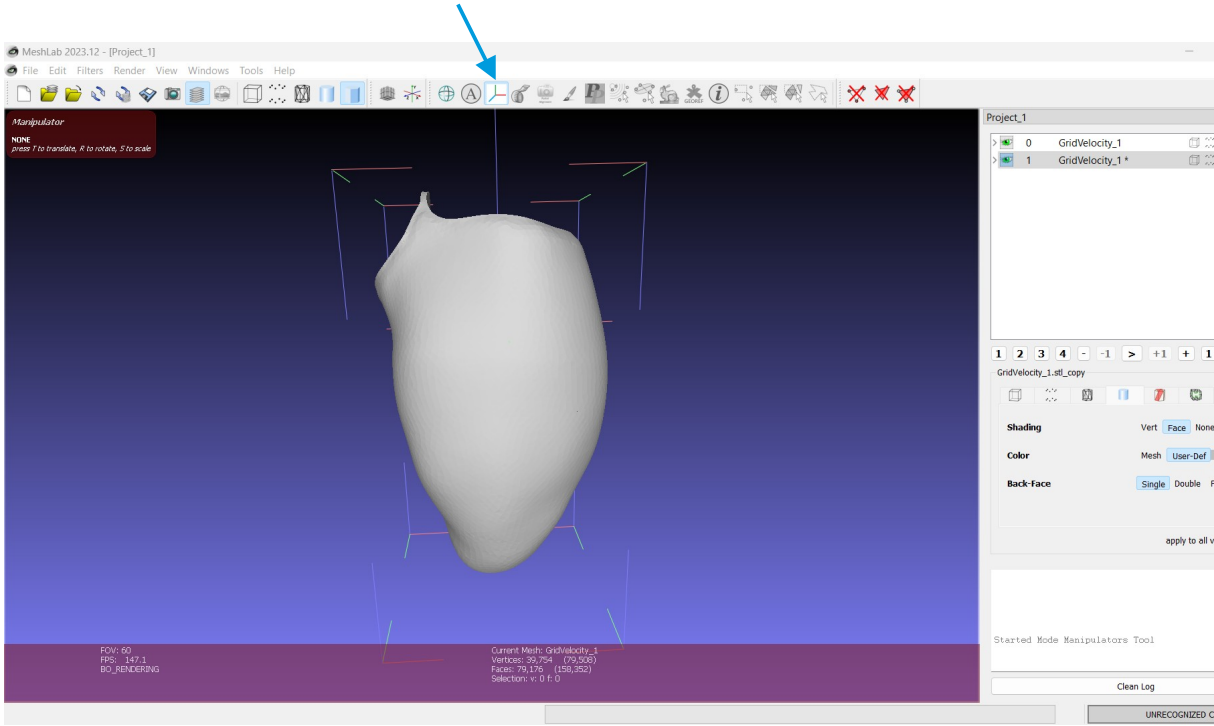
- File → Export Mesh as → choose the « .stl » type of file
- You now have a « .stl » that can be exported to gmsh if you want.
- You can also give it a thickness.
- Open your « .stl » file in Meshlab.



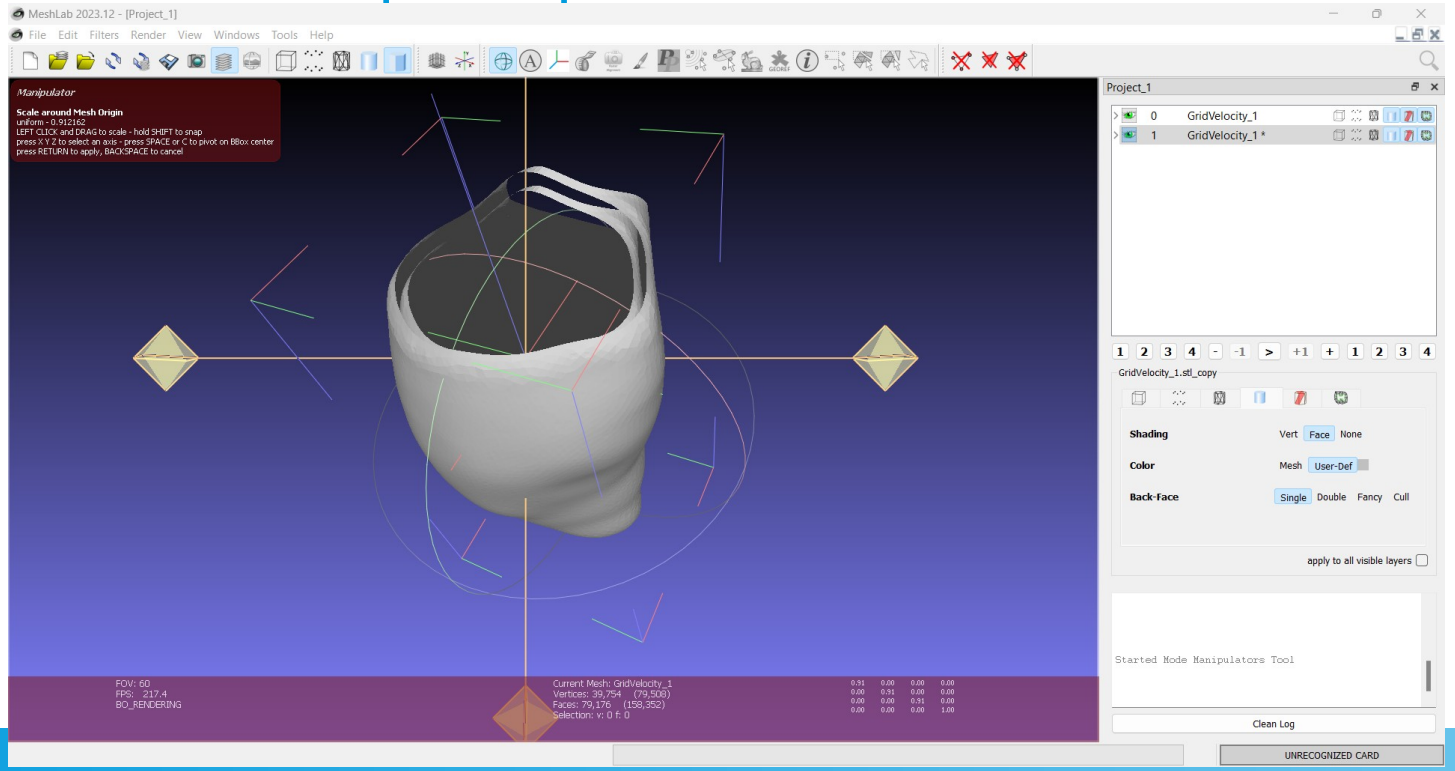
- On the right, do a right click on « GridVelocity »
- Duplicate curent layer



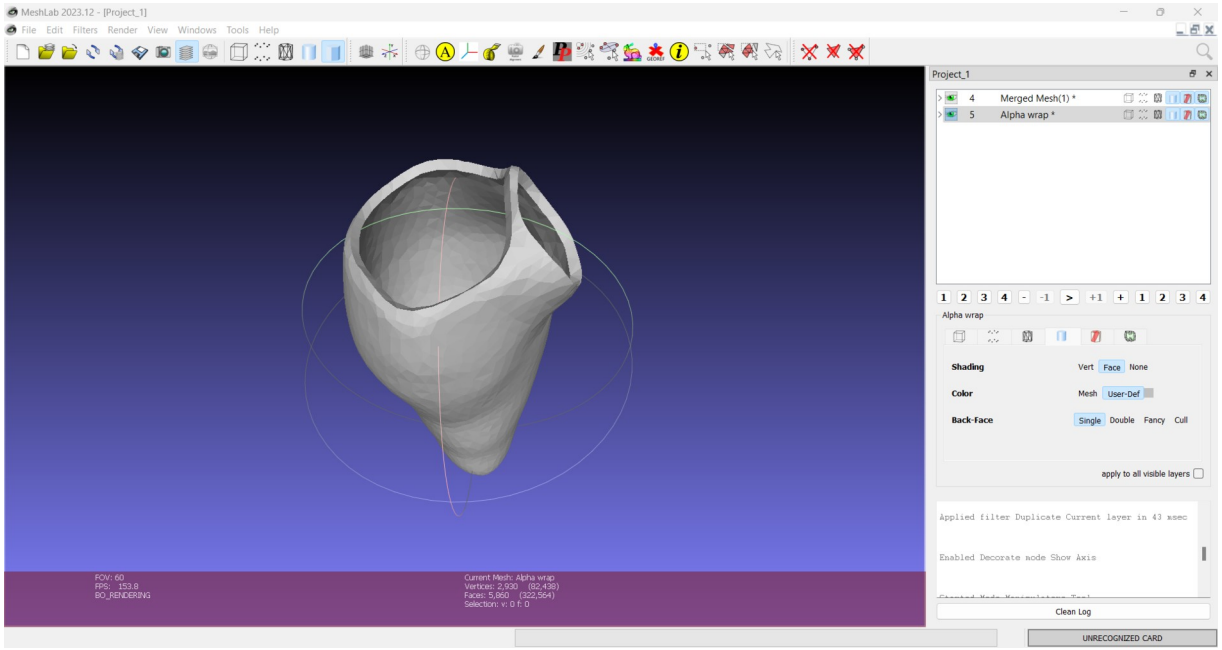
- Click on one of the layer
- Click on the manipulator tools
- Press « S » to scale



- Scale Down or up and press enter to validate



- Right click on one of the layer
- Flatten all visible layers
- Right click again
- Alpha wrap
- You can save or do some more smoothing.



Closing words

- You can search tutorials on Youtube
- Here is one : https://www.youtube.com/watch?v=38mt3kpsxd4
- However it uses « Poisson » function for the remeshing, sadly it doesn’t really works for us but you can try.
- MeshLab : https://www.meshlab.net/
- Gmsh : https://gmsh.info/