# IMA 208: LAB 6 – Range scan to meshes

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1. Delaunay filtering on bunny scan

In the file SimpleFiltering_fixed_threshold.py, you can find the code used to create the meshes of bunny.stl. We get pretty convincing result with a threshold on Delaunay triangle circumradius of **0.005**.

As file bimba_fixed.stl shows, we can't get results as good on the bimba point cloud, because their point density isn't regular, the point cloud is very sparse.

We need to use an adaptative threshold.

2. Adaptative threshold

In the file SimpleFiltering_adaptative_threshold.py, you can find our proposition of an implementation of an adaptative threshold.

For each simplice, we compute the point density of its vertices, in order to know if we are in a sparse region of our point cloud or not: if so, we must have higher threshold on the circumradius.

By denoting **d** the mean point density of the neighborhood of vertices, we can choose a threshold t as follows:

$$t = e^{-\frac{d}{\gamma}}$$

$\gamma$ is a parameter that we can tune to obtain a better mesh.

The results we get aren't actually very convincing, as showed in bimba_adaptative.stl.