ROB-317 TP RANSAC

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Question 1

What does the prominent plane represent in the cloud? How many points does it count?

The prominent plane represents the floor in the cloud of the indoor environment.

After running RANSAC several times, I found that it counts about 135 000 points.

Question 2

How many tries do you need to get 99% chance of finding this plane?

To calculate the number of iterations required to have a 99% chance of finding the prominent plane, we use the following formula:

$$k_{\min} = \frac{\log(1-p)}{\log\left(1 - \left(\frac{n}{N}\right)^3\right)}$$

Where:

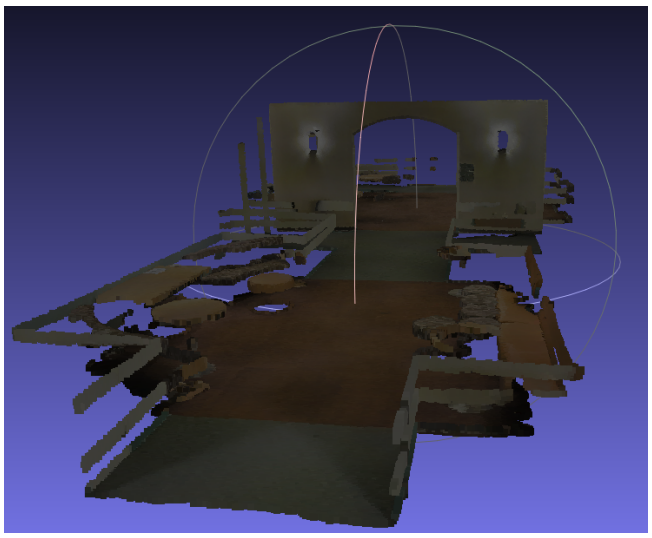
- p is the probability of finding the plane.
- n is the number of points in the plane (here $\sim$ 135 000).
- N is the total number of points in the point cloud (here 412 756).

By plugging in the values, we get $k_{\min} \approx 130$ iterations.

Question 3

Show a screenshot of the extracted planes. Are you satisfied with the extraction? Explain what produces this behaviour.

The extracted planes are shown in the following image:



Extracted Planes with multi-RANSAC

We can see that the prominent plane, with some other planes such as some walls or objects are extracted.

However, I am not completely satisfied with the extraction because I would have thought that more walls would have been extracted. I believe this is due to the fact that walls might not be very dense and that some objects are well more detailed than them, causing the algorithm to prefer them.