Experiment 1 : Plane segmentation of Sink Countertop
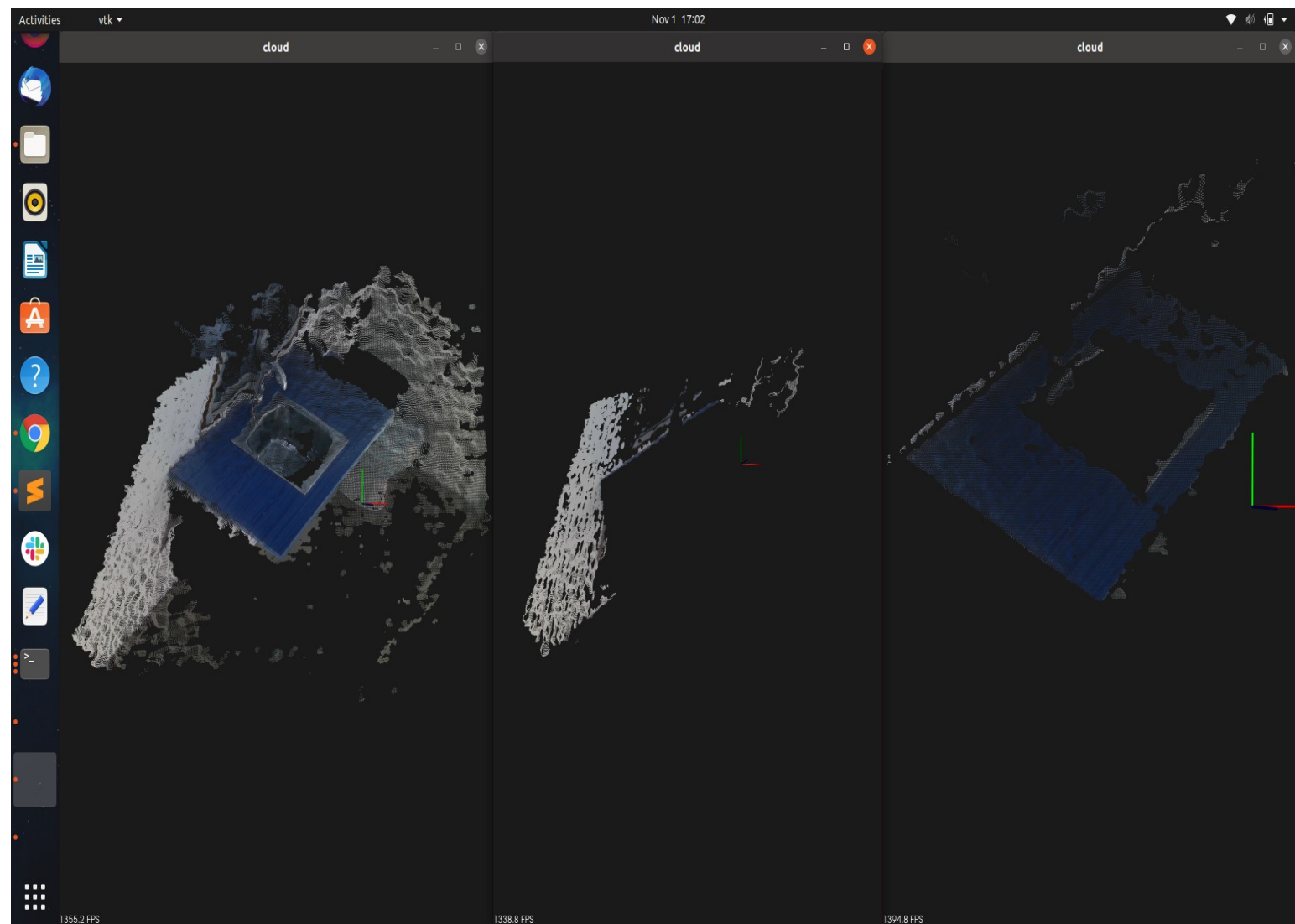
Using the previous collected point clouds I have applied RANSAC (from PCL) inorder to extract the planes.

The results are as shown below

The first image on the left represents the point cloud, The 2nd and 3rd images represents the planes extracted from the pointcloud using RANSAC .

However I will be collecting new data of the counter top since there has been changes made to it in the previous week and I will be repeating the above experiment.

Note: RANSAC in PCL does not return multiple planes, So each time a plane is returned the corresponding points in the point cloud is deleted and again passed through RANSAC for segmenting another plane.

Experiment 2 : Homography experiment

I conducted the experiment of homography in ground floor lab where 18 points were used

14 : Training
4 : Testing

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navneeth@navneeth-HP-Laptop-15q-ds0xxx:~/Desktop/artpark/robojanitor$ python3 homography_estimate.py
Total size of points: 18, training size: 14, testing size: 4
x_error:  [0.6666666666666666, 0.5773502691896257, 0.6666666666666666, 0.9428090415820635, 0.7453559924999299]
y_error:  [0.7453559924999299, 1.0, 1.1547005383792515, 1.247219128924647, 0.47140452079103173]
x_error:  0.7197697273209904
y_error:  0.9237360361189719
Test x error:  [0, 4, 0, 1]
Test y error:  [1, 1, 0, 1]
TEST points       Reprojected points
[  0 200]            [  0 199]
[ 50 350]            [ 48 351]
[  0 300]            [  0 300]
[-50 300]            [-49 299]
Test x error:  0.5590169943749475
Test y error:  0.4330127018922193
```
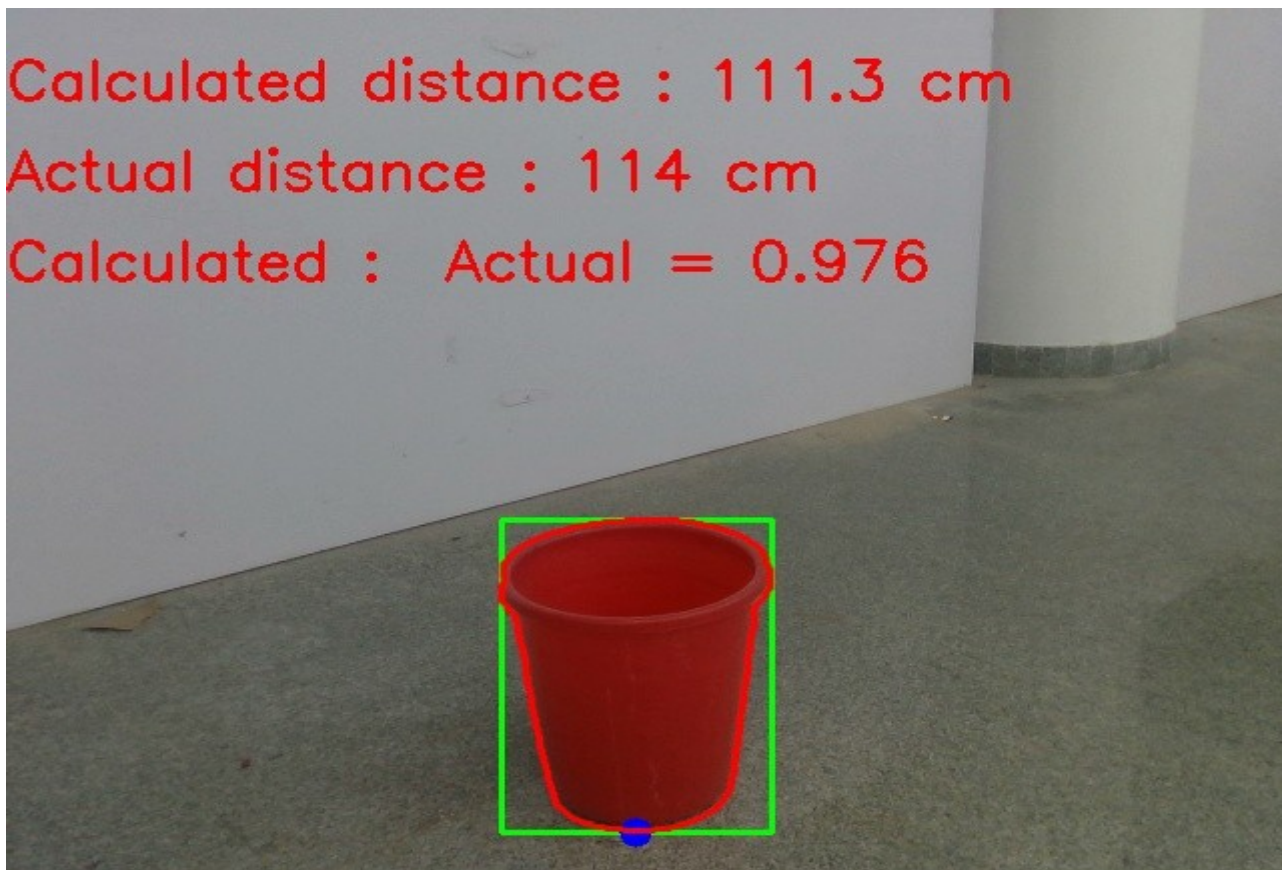
Then the dustbin was placed in the ground floor lab and the distance was measured

Calculated distance : 111.3 cm
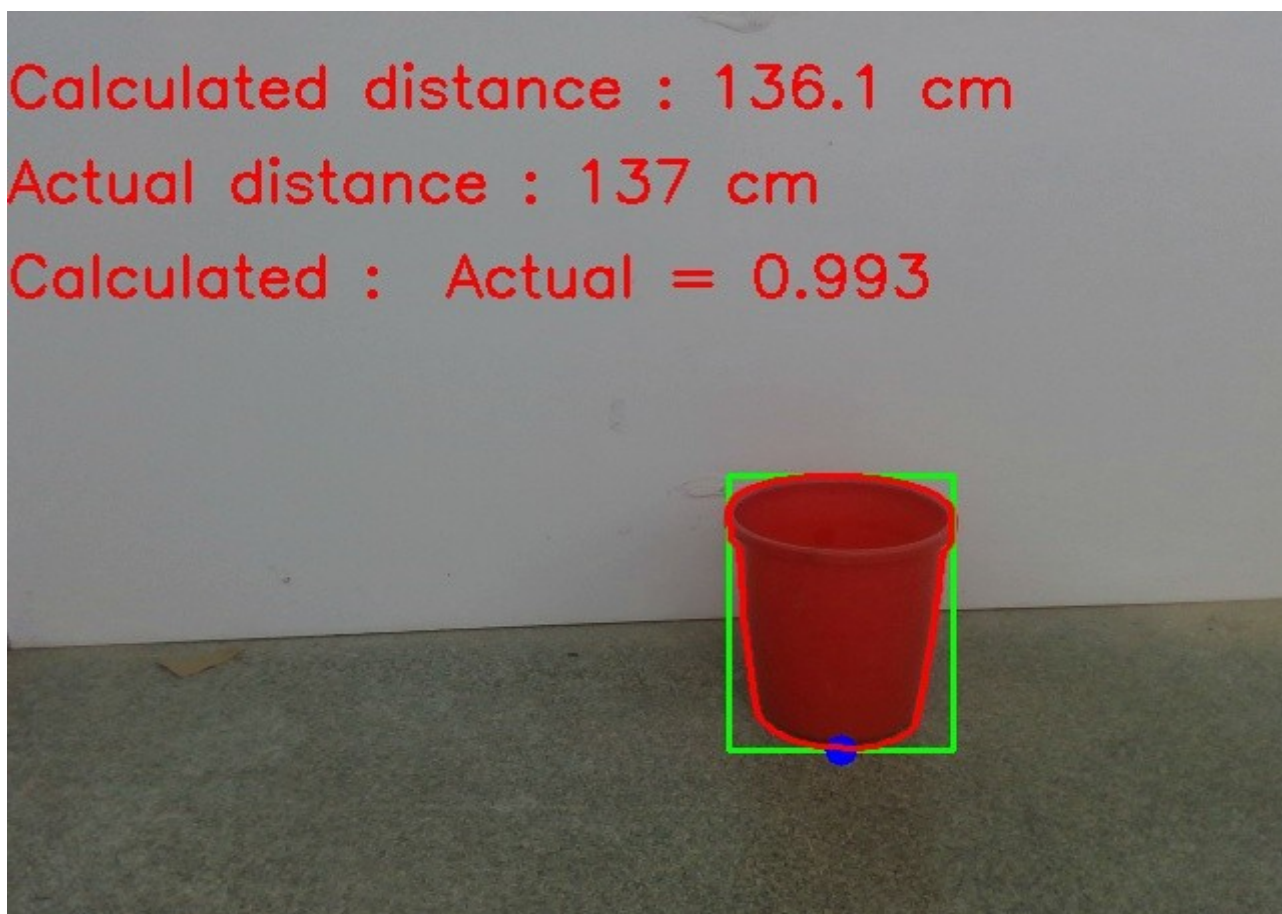Actual distance : 114 cm
Calculated : Actual = 0.976

Calculated distance : 136.1 cm
Actual distance : 137 cm
Calculated : Actual = 0.993

It was then tested with dutbin in 4th floor at the bathrrom setup

The dutbin was kept at distances such as 110,130,150,170... and the distance was caluclated each time. The results is as shown below

The blue points represent the position where the dutbin was placed

A: stands for the actual distance from the camera to the point

C : represents the distance calculated through homography matrix