Robot Autonomy Homework 1

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1.
We think this configuration might not work in practice. Because the contact area is small and the wrench could be easily broken.

Do note that nobody has a uniquely good solution for grasp metrics, so while we expect the results to be somewhat reasonable, there will be many things that look "funny". You're expected to point this out when you notice it.

(With Noise is better)

Performance: 0.203134234658

2.We averaged out the volume of ellipsoid in wrench space and minimum singular value of G to acquire quality measures.

Order Grasp - Champagne

Showing best 10 indexes
0.115486648568
0.0930070343214
0.0707723776663

0.0362948291118
0.0326158410923
0.0303879920349
0.0252923035966
0.0197465369704
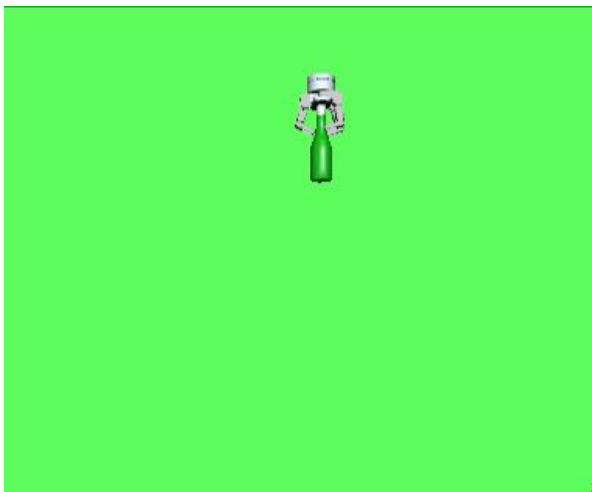0.0179411926973
0.0171170756418

Performance: 0.115486648568

Performance: 0.0930070343214

Performance: 0.0707723776663
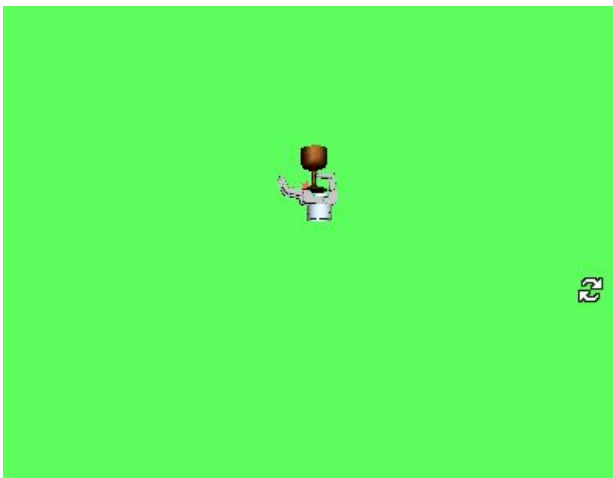

Performance: 0.0362948291118

Order Grasp - Winegoblet
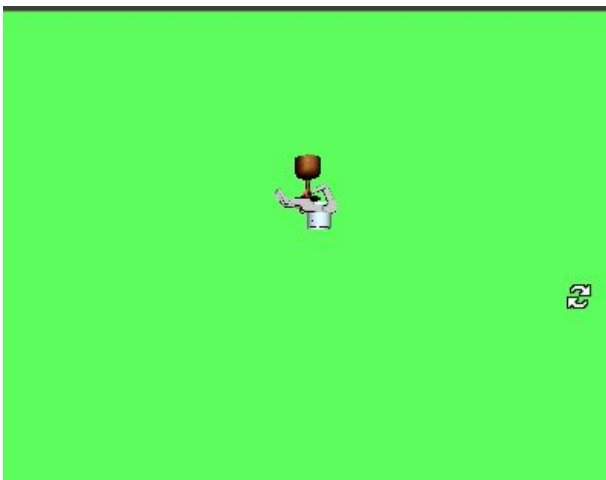
Showing best 10 indexes
0.238162512892
0.0726318305455
0.0613262093677
0.0490407371973
0.0326446899291
0.0212707338645
0.0126347336201
0.0125932814413
0.0121184320649
0.0115848287377

Performance: 0.238162512892

Performance:0.0726318305455

Performance: 0.0613262093677

Performance: 0.0490407371973

Order Grasp - Black Plastic Mug

Showing best 10 indexes
0.36553685428
0.0917073801048
0.0507048840793
0.0403990765488
0.0387100456794
0.0357706248345
0.0348370047841
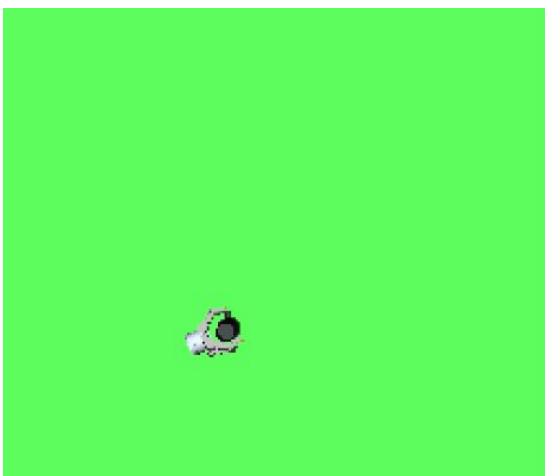0.0287595999669
0.0280639111368
0.0261640264144

Performance: 0.36553685428

Performance: 0.0917073801048

Performance: 0.0507048840793

Performance: 0.0403990765488

4.We sample 10 random poses of each grasp and use the one with the highest quality measure. According to the evaluation, adding noise does help for some cases like champagne. The outcome of mug seems similar, however the adding noise strategy doesn't seem to help in the winegoblet case.

Noisy Order Grasp - Champagne

Showing best 10 indexes
Performance = 0.203134234658
Performance = 0.0678417720626
Performance = 0.0298263983667
Performance = 0.027896607076
Performance = 0.0223557187748
Performance = 0.0201997954512
Performance = 0.0199899347088
Performance = 0.0171869586953
Performance = 0.0164149210302
Performance = 0.0154188725746

Performance: 0.203134234658

Performance: 0.0678417720626

Performance: 0.0298263983667

Performance: 027896607076

Noisy Order Grasp - Winegoblet

Showing best 10 indexes -
Performance = 0.0940944010357
Performance = 0.0940531632452
Performance = 0.0694660231504
Performance = 0.0654567713723
Performance = 0.0425283596247
Performance = 0.0415343028347
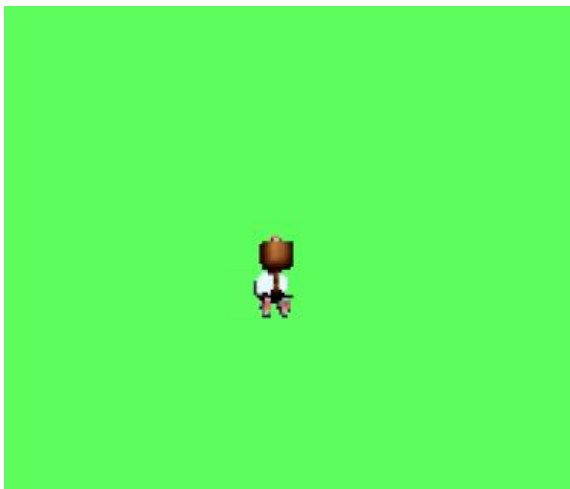Performance = 0.0344921160873
Performance = 0.0318837863597
Performance = 0.0311787191029
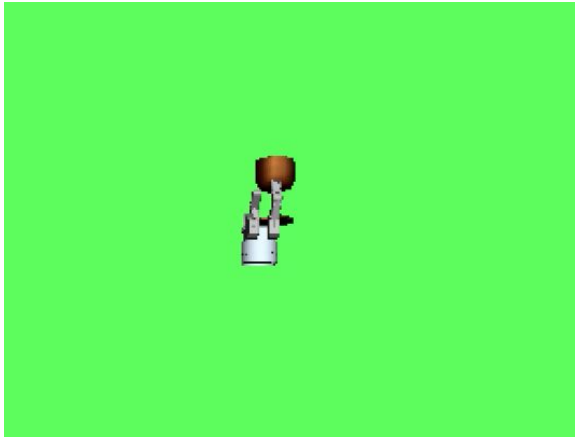Performance = 0.0289869074871

Performance: 0.0940944010357

Performance: 0.0940531632452

Performance: 0.0694660231504

Performance: 0.0654567713723

Noisy Order Grasp - Black Plastic Mug

Showing best 10 indexes - black plastic mug
Performance = 0.35754312538
Performance = 0.106587442903
Performance = 0.0890737834225
Performance = 0.0409292746134
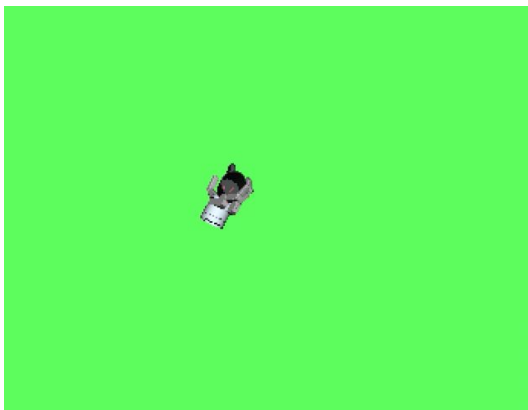Performance = 0.0367213181706
Performance = 0.0326421882261
Performance = 0.023387406664
Performance = 0.0192749309898
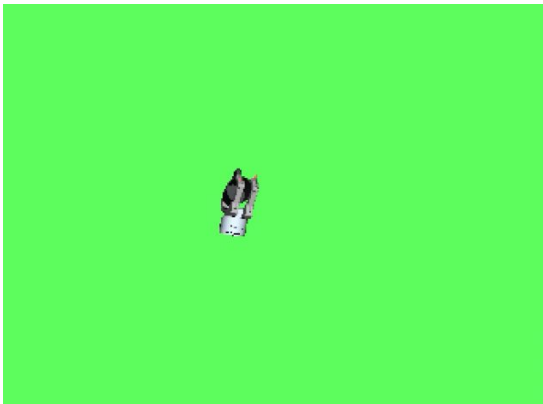Performance = 0.018640976587
Performance = 0.0176516258725

Performance: 0.35754312538

Performance: 0.106587442903

Performance: 0.0890737834225

Performance: 0.0409292746134

5.It took us about two days to complete the code and one hour to run each test. In total, it tooks us about four days to complete the assignment.