

Robot Manipulators and Automation

AUTO4507

Lab Assignment 4 – *Group* – Pick and Place

Points: 5+5 = 10

Experiment 1 – Pick and Place

Write a program that:

- Identifies each object in the camera image
- Calculates the required gripper pose for the object
- Picks up the object
- Lifts it out of the way
- Places and releases the object in the middle of the black pad.

Note:

- Objects will be spaced out so they can be picked without touching a neighboring object.
- Remove a placed object by hand, before the next object can be searched.

Experiment 2 – Sorting

Extend the pick-and-place program by sorting the objects by shape. Assume that the wooden plate is at a **fixed, known location**.

There will be four objects of different shapes in the manipulator's operating area, which should be put back onto its wooden plate. Each object has to be correctly classified as one of four given shapes and then picked and placed into its corresponding position on the plate.

Use OpenCV in Python or C++ for object and shape detection:
<https://stackoverflow.com/questions/11424002/how-to-detect-simple-geometric-shapes-using-opencv>

