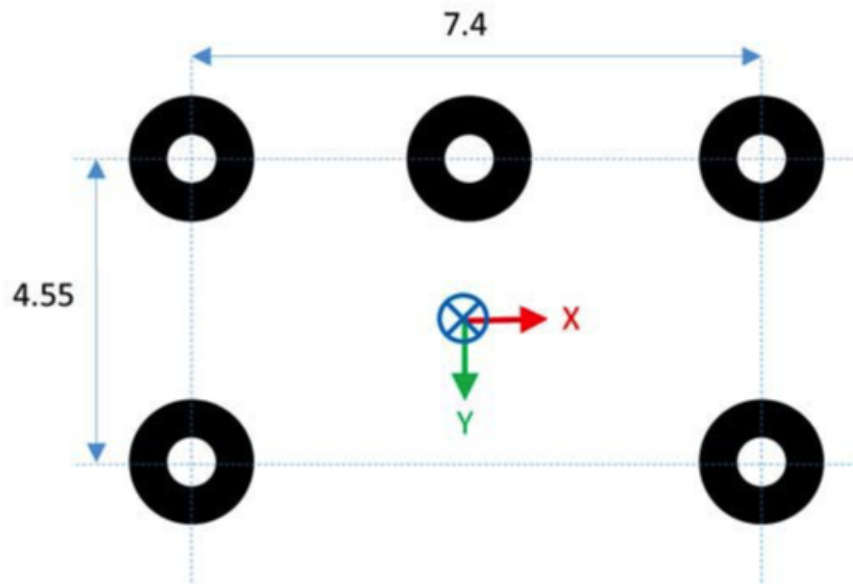


This assignment is to be carried out individually in Matlab and you have to deliver the code, with results and calculations in a single PDF file. You have to show the results in class.

Nombre y apellidos: _____

Exercises

1. The objective of this exercise is to compute the pose of a known object with respect to a camera, from a set of correspondences between object points and observed image points. In Lecture 13 on “Linear Pose Estimation”, I gave an example of how to compute the pose using the Direct Linear Transform algorithm. Using that method, find the pose of the 5-point concentric circle target with respect to the camera. Use the images “robot1.jpg”, “robot2.jpg”, and “robot3.jpg” on the course website. The measurements of the model (in inches) are indicated in the figure. The top middle target feature is midway between the top left and the top right feature. Use the top left feature as the origin of the target’s coordinate system, with its x-axis pointing to the right, its y-axis pointing down, and its z-axis pointing into the page.



- For each image, give the pose of the target with respect to the camera (in terms of XYZ angles and XYZ translation) in each image.
- Use that pose to draw the XYZ coordinate axes of the target as an overlay on each image.

Note: Use the following values for the camera intrinsic parameters: focal length = 2443 (in pixels), image center $(x, y \text{ in pixels}) = (1124, 831)$.