Homework-10

Q1:

You are given the following values of the camera calibration parameters:

f = 2, u0 = 0, v0 = 1

Compute the image location of the following 3D point:

X = 7, Y = 13, Z = 2

Answer:

Q2:

A point at the coordinates (u, v) in the picture is a projection of a 3D point X, Y, Z. Given that the camera calibration parameters f, u0, v0, and that the 3D point X, Y, Z is on the plane

Z = aX + bY + c

prove that:

Compute Z as an explicit function of u, v, a, b, c, f, u0, v0.

Answer:

Ignore the discussion of divide 0 for this question.

From Z = aX + bY + c, we have:

From (1) we have:

For x = u – u0, y = v – v0 and (2), we have:

Proofed.