COL780 Assignment-3 Report

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Part-1 Camera calibration

Calibrated camera using chessboard method discussed in class.

Main steps involved are-

1.detect good corners of chessboard

2.compute homography between 3d world pts and 2d image pts

3.compute vanishing points by taking image of orthogonal direction with help of homography matrix

4.Use Direct Linear Transform to compute parameter of W matrix involved-

- v2.T @ W @v1 =0
- here v1,v2 is vanishing pt pair and W =K_inv.T @K_inv
- then use DLT and further cholesky decomposition for finding K

Intrinsic parameter ,K obtained -

k = [[8.0254254e+02, 1.6457086e+02, 6.5770942e-01],

[0.0000000e+00, 7.0912805e+02, 4.1176298e-01],

[0.0000000e+00, 0.0000000e+00, 1.0000001e+00]]

Part-2 Placing virtual object on image

Here found homography matrix like above using chessboard_corners.

Then found extrinsic parameters for particular image by comparision with this eqn-

R =[r1,r2,r3]

k [r1,r2,t] = h (homography)

P =k [R |t]

Then projected coordinates of cube using P matrix and then rendered on image.

Some of the image results -