

camera_calibration

July 23, 2024

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[1]: import numpy as np
import cv2
import glob

checkerboard_dims = (8, 6)

objp = np.zeros((checkerboard_dims[0] * checkerboard_dims[1], 3), np.float32)

objp[:, :2] = np.mgrid[0:checkerboard_dims[0], 0:checkerboard_dims[1]].T.
    ↪reshape(-1, 2)

objpoints = []
imgpoints = []

images = glob.glob('/home/charlarthebar/laboratory_2024/week_1_Hw/
    ↪camera_calibration_photo_mosaic/calibration_photos/*.jpg')
print(f"Found {len(images)} images")

for image in images:
    img = cv2.imread(image)
    gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)

    bool, corners = cv2.findChessboardCorners(gray, checkerboard_dims, None)
    if bool == True:
        objpoints.append(objp)
        corners2 = cv2.cornerSubPix(gray, corners, (11,11), (-1,-1), None)
        imgpoints.append(corners)

        cv2.drawChessboardCorners(img, checkerboard_dims, corners2, bool)
        cv2.imshow('img', img)
        cv2.waitKey(1000)

cv2.destroyAllWindows()

ret, cameraMatrix, dist, rot_vecs, trans_vecs = cv2.calibrateCamera(objpoints,
    ↪imgpoints, gray.shape[::-1], None, None)
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np.savez('camera_calibration.npz', cameraMatrix=cameraMatrix, dist=dist,
        ↪rot_vecs=rot_vecs, trans_vecs=trans_vecs)

mean_error = 0

for i in range(len(objpoints)):
    imgpoints2, _ = cv2.projectPoints(objpoints[i], rot_vecs[i], trans_vecs[i],
        ↪cameraMatrix, dist)
    error = cv2.norm(imgpoints[i], imgpoints2, cv2.NORM_L2)/len(imgpoints2)
    mean_error += error

print( "total error: {}".format(mean_error/len(objpoints)) )

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['/home/charlarthebar/laboratory_2024/week_1_Hw/camera_calibration_photo_mosaic/
calibration_photos/calib8.jpg', '/home/charlarthebar/laboratory_2024/week_1_Hw/c
amera_calibration_photo_mosaic/calibration_photos/calib18.jpg', '/home/charlarth
ebar/laboratory_2024/week_1_Hw/camera_calibration_photo_mosaic/calibration_photo
s/calib16.jpg', '/home/charlarthebar/laboratory_2024/week_1_Hw/camera_calibratio
n_photo_mosaic/calibration_photos/calib14.jpg', '/home/charlarthebar/laboratory_
2024/week_1_Hw/camera_calibration_photo_mosaic/calibration_photos/calib11.jpg',
'/home/charlarthebar/laboratory_2024/week_1_Hw/camera_calibration_photo_mosaic/c
alibration_photos/calib13.jpg', '/home/charlarthebar/laboratory_2024/week_1_Hw/c
amera_calibration_photo_mosaic/calibration_photos/calib4.jpg', '/home/charlarthe
bar/laboratory_2024/week_1_Hw/camera_calibration_photo_mosaic/calibration_photos
/calib9.jpg', '/home/charlarthebar/laboratory_2024/week_1_Hw/camera_calibration_
photo_mosaic/calibration_photos/calib6.jpg', '/home/charlarthebar/laboratory_202
4/week_1_Hw/camera_calibration_photo_mosaic/calibration_photos/calib10.jpg', '/h
ome/charlarthebar/laboratory_2024/week_1_Hw/camera_calibration_photo_mosaic/cali
bration_photos/calib7.jpg', '/home/charlarthebar/laboratory_2024/week_1_Hw/camer
a_calibration_photo_mosaic/calibration_photos/calib19.jpg', '/home/charlarthebar
/laboratory_2024/week_1_Hw/camera_calibration_photo_mosaic/calibration_photos/ca
lib1.jpg', '/home/charlarthebar/laboratory_2024/week_1_Hw/camera_calibration_pho
to_mosaic/calibration_photos/calib20.jpg', '/home/charlarthebar/laboratory_2024/
week_1_Hw/camera_calibration_photo_mosaic/calibration_photos/calib3.jpg', '/home
/charlarthebar/laboratory_2024/week_1_Hw/camera_calibration_photo_mosaic/calibra
tion_photos/calib5.jpg', '/home/charlarthebar/laboratory_2024/week_1_Hw/camera_c
alibration_photo_mosaic/calibration_photos/calib12.jpg', '/home/charlarthebar/la
boratory_2024/week_1_Hw/camera_calibration_photo_mosaic/calibration_photos/calib
17.jpg', '/home/charlarthebar/laboratory_2024/week_1_Hw/camera_calibration_photo
_mosaic/calibration_photos/calib2.jpg', '/home/charlarthebar/laboratory_2024/wee
k_1_Hw/camera_calibration_photo_mosaic/calibration_photos/calib15.jpg']
Found 20 images
total error: 0.11769821665723187

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