Assignment 1

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Head over to GitHub (https://github.com/RohanBera/computer-vision/tree/main/assmt1) for the code.
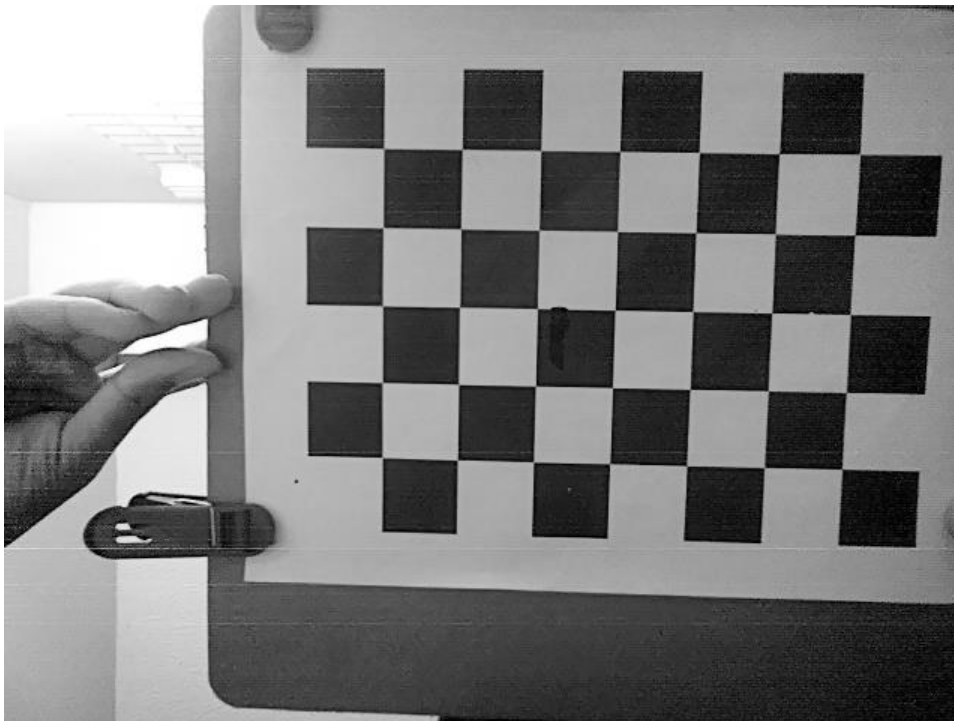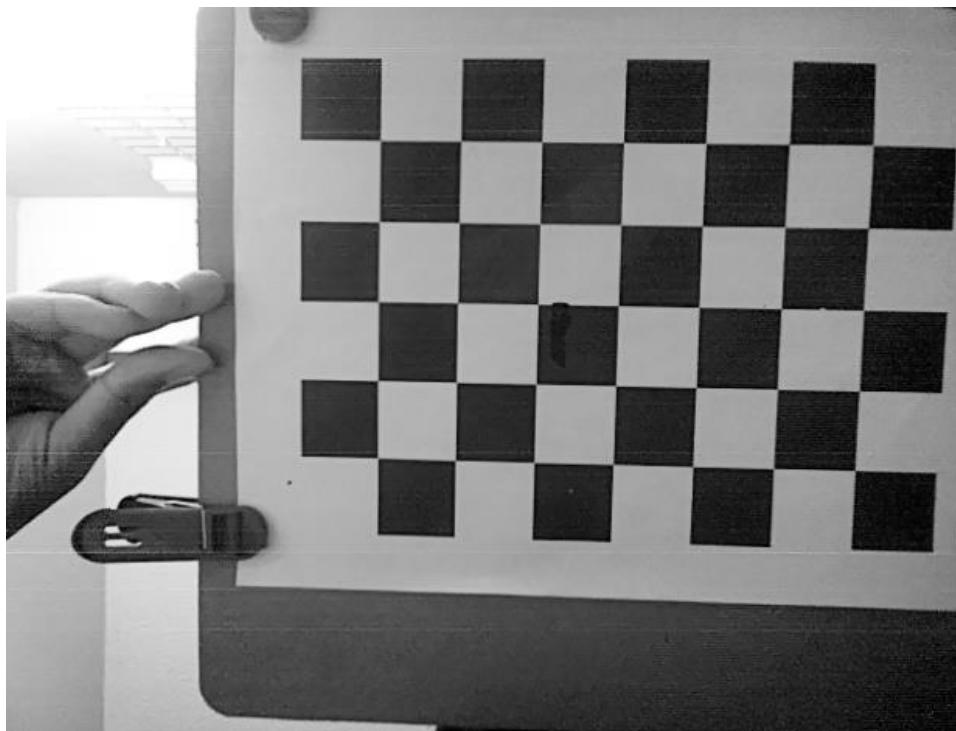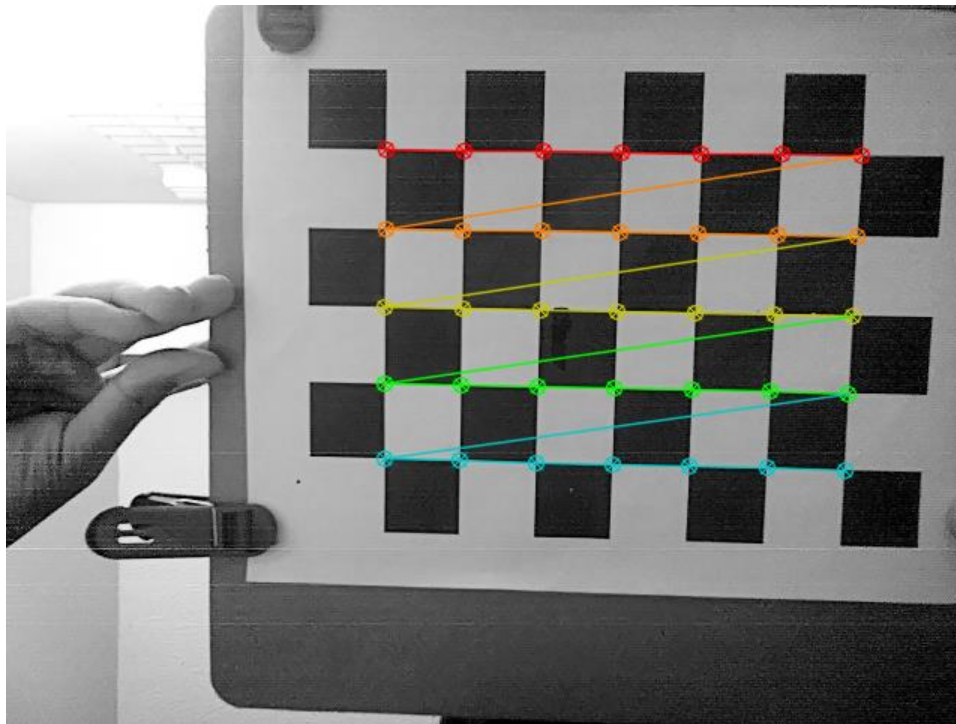
Question 1

To calibrate the camera, I used a 8x6 checkerboard pattern. The code to take 10 images of the checkerboard using both the monochrome (left and right) and color cameras can be found in the file q.ipynb.

The images captured can be found in the folder 'images'.

The images are then used for calculating the camera matrix, translation and rotational vectors.

The corrected images are found in the 'images' folder and the corresponding camera values are stored in their respective folders (left, right and color).

Question 2

The camera matrix, rotational matrix and translation matrix which were stored in the above step are used to calculate translate the image coordinate to world coordinate.

two pixel coordinates (whose distance we want to measure) are chosen from an image and are converted into world coordinate. The distance between these 3d points then determine the real world distance.

Question 3

In this question, I was successfully able to simultaneously display the live depth map and the color camera feed while displaying the frame rate in the terminal. I was able to reach frame rates of upto 100 Frames per second on my computer.

Question 4

For q4, we have to use the calibration code provided to us by the depth ai team. Since we are using "Oak D Lite", we need to download the sdk from the "depthai-lite" branch on GitHub.

All the required files and directories can be found in "q4"

Once downloaded, we can run the "install_requirements.py" file to install all the required dependencies.

Once this is done, we can run the "caliberate.py" file to begin the calibration process.

The code prompts us to place the checker board in certain angles and orientations. Once the program completes execution, we get the camera matrix.

We observe that the camera matrices are almost identical.