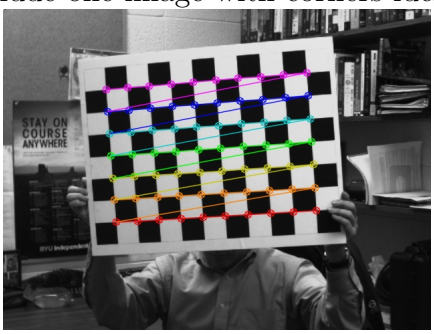
Lab 2 Report

Part 1 - Corner Detection

Include one image with corners identified.



Part 2 - Intrinsic Parameters

Intrinsic Matrix:

$$\begin{bmatrix} 1145.37 & 0 & 328.0 \\ 0 & 1143.77 & 222.23 \\ 0 & 0 & 1 \end{bmatrix}$$

Distortion Parameters:

$$\begin{bmatrix} -0.258 \\ 0.0423 \\ -0.0014 \\ -0.0014 \\ 1.746 \end{bmatrix}$$

Part 3 - Distortion Correction

(a) Far diff

(b) Near diff

(c) Turned diff

Part 4 - Object Pose Estimation

Rotation Matrix:

$$\begin{bmatrix} 0.5855 & 0.3246 & 0.7429 \\ 0.2130 & -0.9458 & 0.2453 \\ 0.7822 & 0.01461 & -0.6229 \end{bmatrix}$$

Translation Matrix:

$$\begin{bmatrix} -1.1785 \\ -0.4288 \\ -1.6175 \end{bmatrix}$$

Part 5 - Intrinsic Parameters

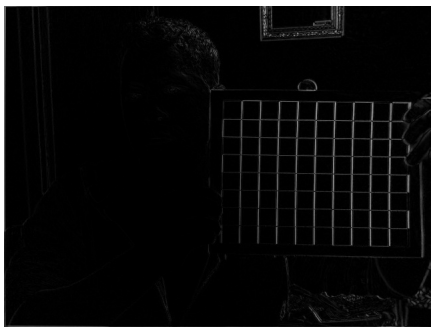
Intrinsic Matrix:

$$\begin{bmatrix} 1599.25 & 0 & 204.666 \\ 0 & 1515.27 & 298.007 \\ 0 & 0 & 1 \end{bmatrix}$$

Distortion Parameters:

$$\begin{bmatrix} 0.03891 \\ 3.7005 \\ 0.0093 \\ -0.0182 \\ -45.8114 \end{bmatrix}$$

Part 6 - Distortion Correction



Explanation

The code provided in the assignment can all be made with the included CMakeLists.txt file. The images that are read in in task 2 need to be in a subdirectory named jpg_calibration and named as in the jpeg folder off the website. The files Close.jpg, Far.jpg, object_with_corners.jpg, and Turned.jpg need to be in the same directory as the build executables. The executable names can be obtained from CMakeLists.txt. The intrinsic parameters file in part 5 requires you to press the spacebar each time you want to take a picture. When you are done acquiring images, press the 'x' key for processing to take place to produce intrinsic parameters. This file also requires the directory 'calibrate_webcam' to be created and/or cleared beforehand (unless c++ automatically creates the appropriate directory)