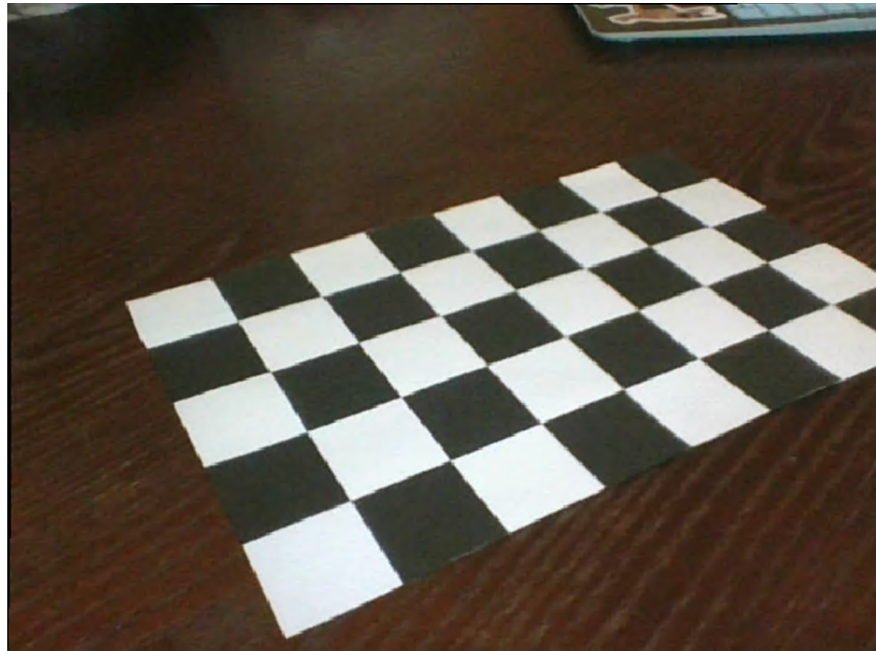


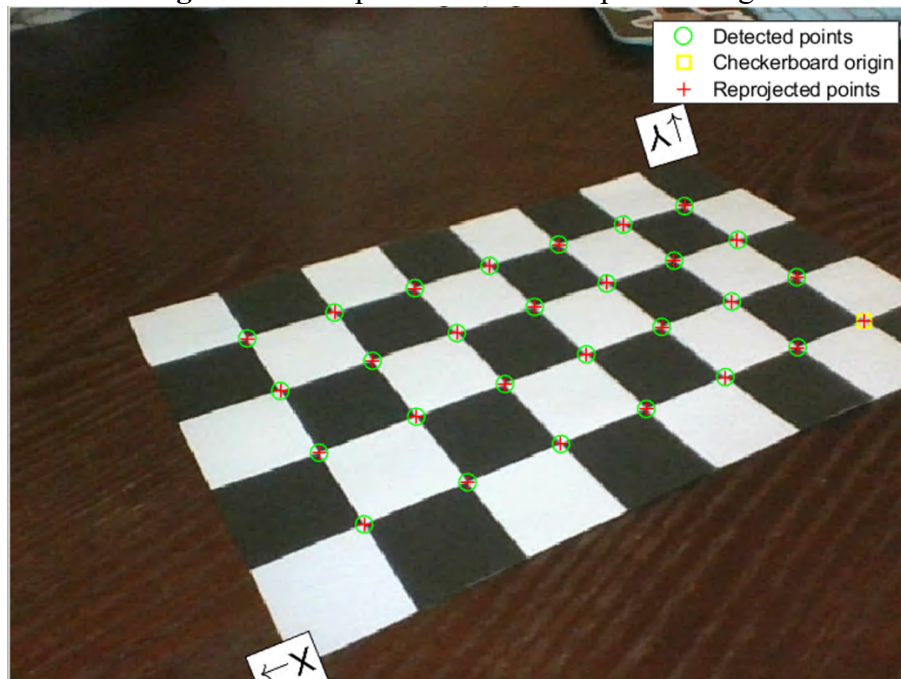
Clemson University  
ECE 4310: Computer Vision  
Lab 6: Camera Calibration  
Sarah Anderson  
Due: November 24, 2020

**Purpose:**

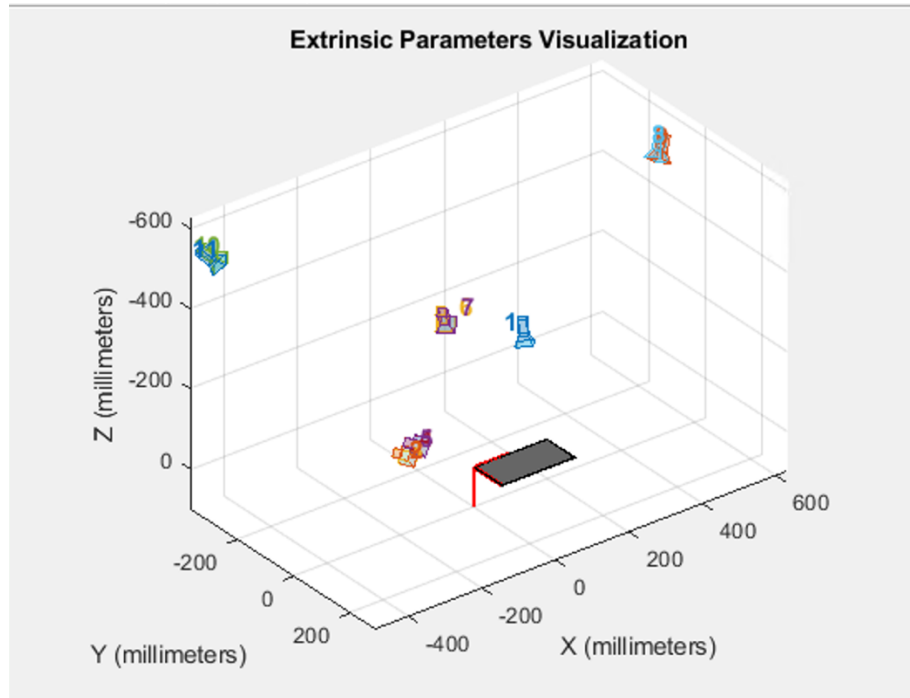
The purpose of this lab is to calibrate my webcam on my personal PC using the integrated MATLAB camera calibration tool that is provided in the Computer Vision Toolbox add-on. I was to print out a checkerboard pattern from the provided website and to take about 5 pictures from different angles and heights. The goal is to find the xyz coordinates for each of the pictures.

**Input/Output:**

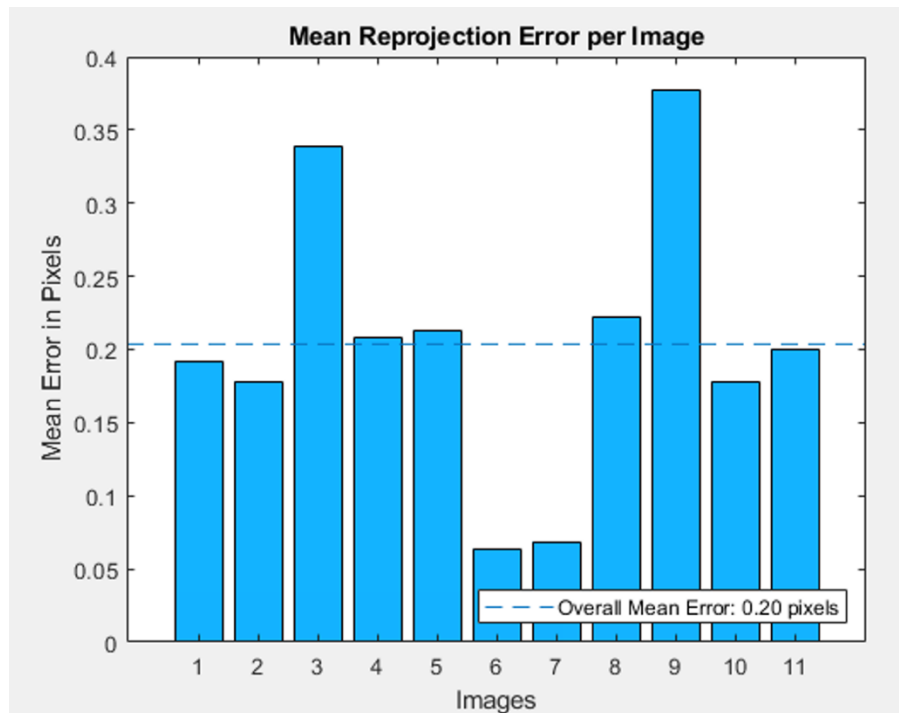
**Figure 1:** Example Picture of an Inputted Image



**Figure 2:** Same Picture as above but with the points indicated



**Figure 3:** Pattern-Centric Form of the Images



**Figure 4:** Mean Error per Image

**Note:** There are two almost exact images from the same location/height due to me taking two from the same location when capturing the pictures from my webcam. They vary slightly due to the movement of my computer.

**Chart of the XYZ coordinates (Pattern-Centric Form):**

<b>Picture Number</b>	<b>X Coordinate (mm)</b>	<b>Y Coordinate (mm)</b>	<b>Z Coordinate (mm)</b>
1	256.8938	-161.2533	-186.2012
2	-300.8407	132.6031	-198.3029
3	-300.4594	132.6117	-197.4010
4	-255.4845	112.7417	-198.7062
5	-255.3354	112.4742	-199.3422
6	-291.4183	266.2976	-602.2683
7	-291.4531	271.6357	-602.6632
8	603.2348	-127.5014	-540.6125
9	608.3261	-125.0039	-537.3479
10	-460.2889	-347.0522	-537.0933
11	-468.4385	-342.6548	-536.2624

**Conclusion:**

The purpose of this lab was to calibrate my PC's camera using MATLAB and a checkerboard pattern printout using 5 different pictures from different angles and heights. The hardest part about this lab was figuring out how to convert the camera-centric coordinates to pattern-centric coordinates. When capturing the images in on my webcam, it took two of the same images from the same location. The two images vary slightly due to me moving my computer.