ECE 6310 – Introduction to Computer Vision – LAB 6 REPORT

CAMERA CALIBRATION

TASK

- Calibrate all six cameras in Riggs Sensor Network Lab
- Generate table of X,Y,Z positions of cameras generated as a result of camera calibration
- Generate following output images:
    1. Polygon drawing
    2. Calibration images for all cameras
    3. Proof of X and Y axes chosen for calibration
    4. Proof of successful tracking of object

DISCUSSION

The following table summarizes the parameters used for calibration:

Parameter	**Value**
X spacing	406
Y spacing	502
Grid Size	4x4
Threshold	150
Orientation of grid	X axis lined up with wall with TV

The following table gives the X, Y, Z (in mm) values after calibration for each camera:

Camera	**X**	**Y**	**Z**
Camera 0	3181	-1356	2272
Camera 1	-87	-1877	2288
Camera 2	-3070	-1754	2209
Camera 3	-2861	3509	2208
Camera 4	158	3338	2007
Camera 5	3112	3312	2118

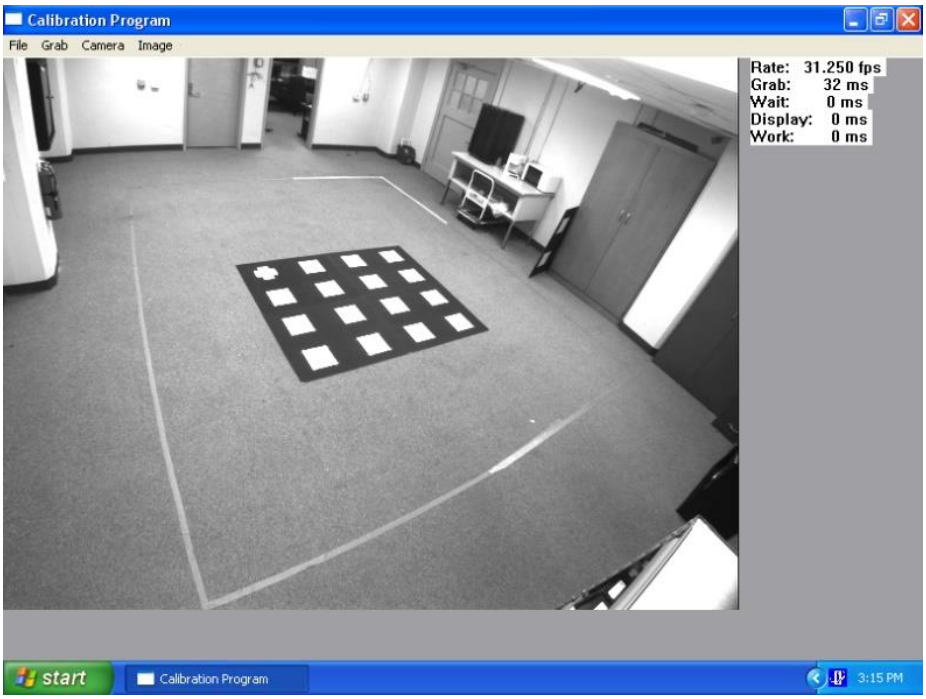
Difficulties Encountered and Rectifications

- When calibrating the second camera, the axis highlighted and the axis for which question was asked were different. This was because it was necessary to click on the radio button even though it appeared to have already been selected by default. Not clicking on the desired answer produced wrong calibration results and often resulted in negative Z values.

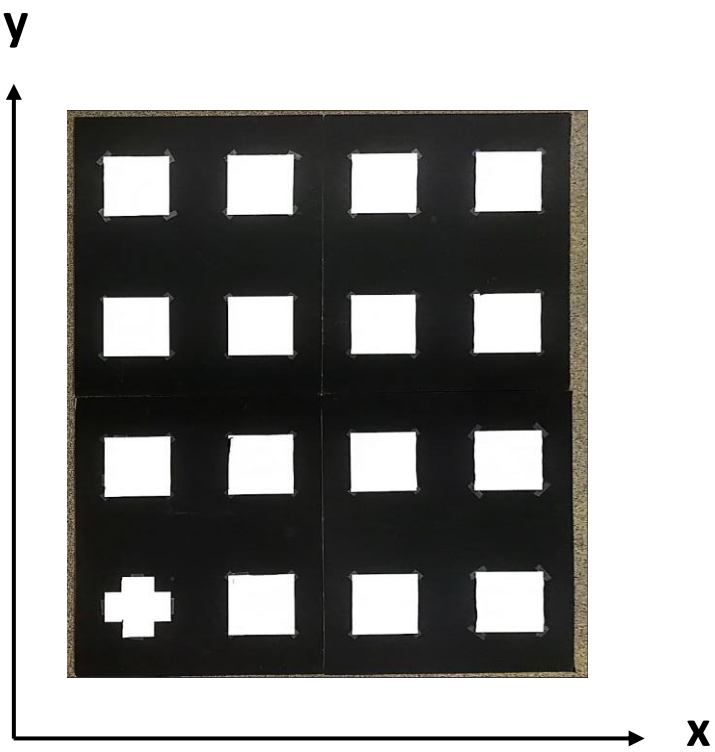
OUTPUTS

Actual Image:

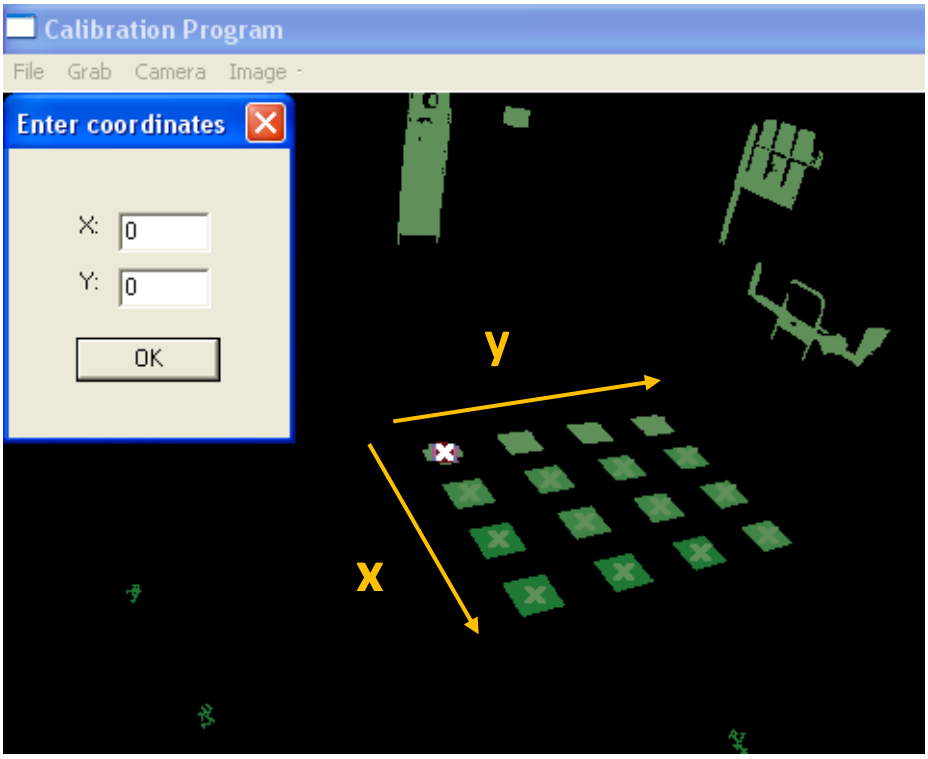
Camera Image from Camera 0:



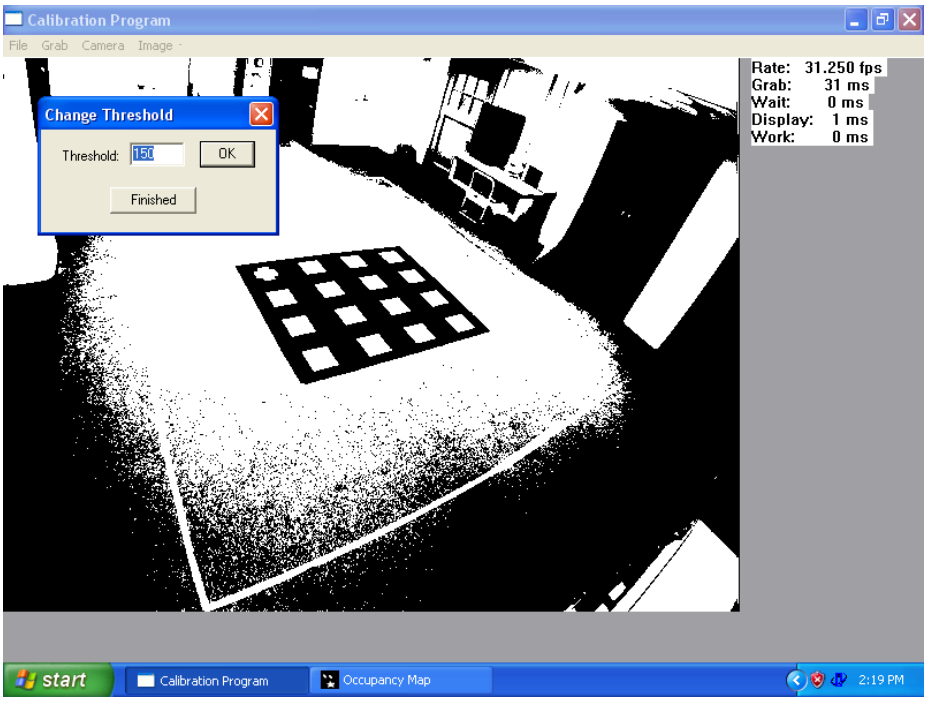
Calibration Target:



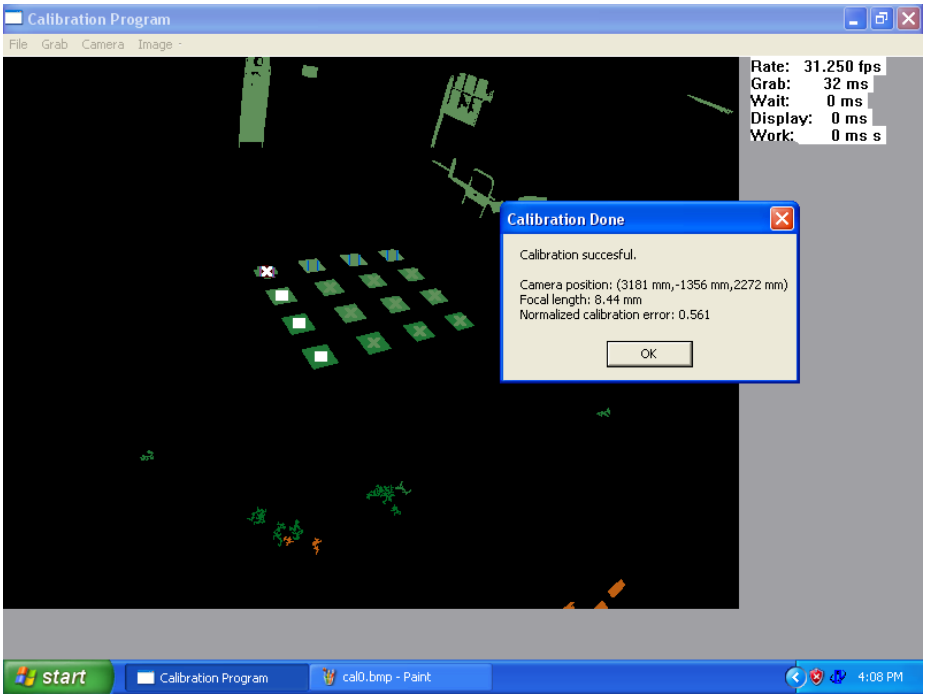
X and Y Orientation:



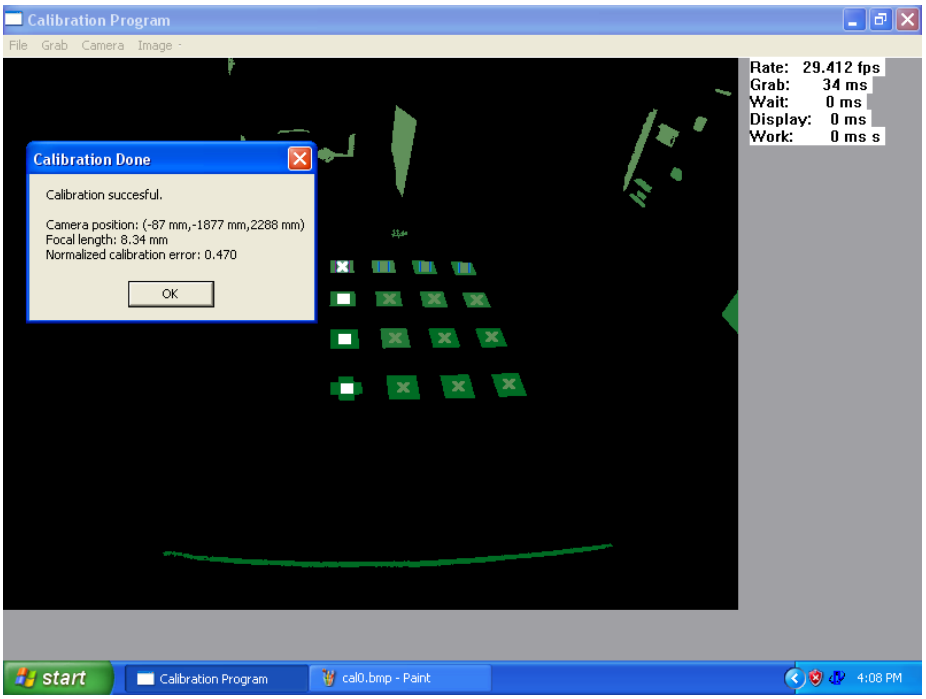
Threshold



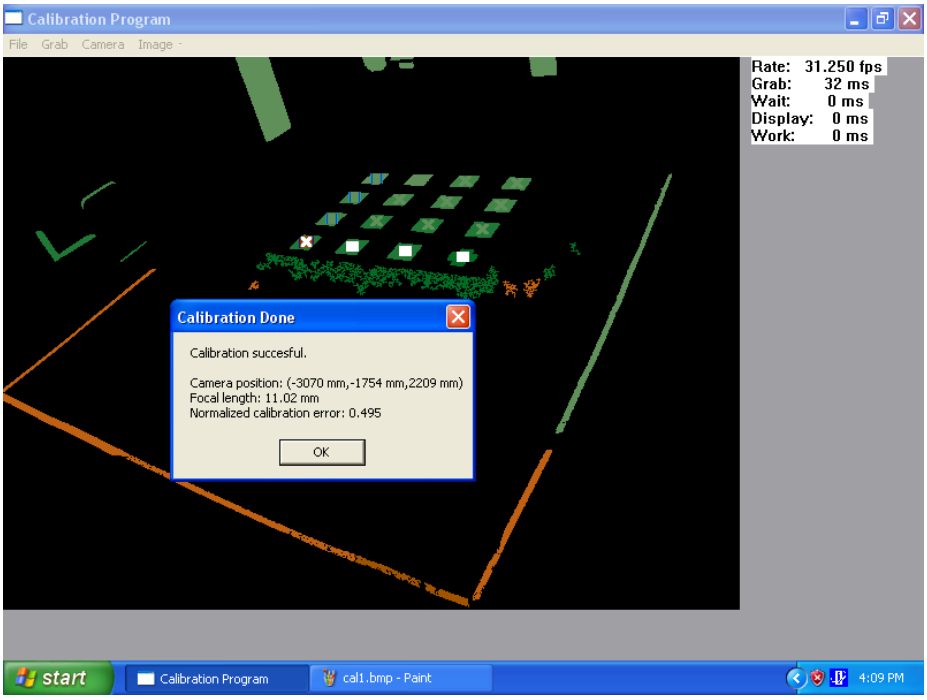
Camera 0



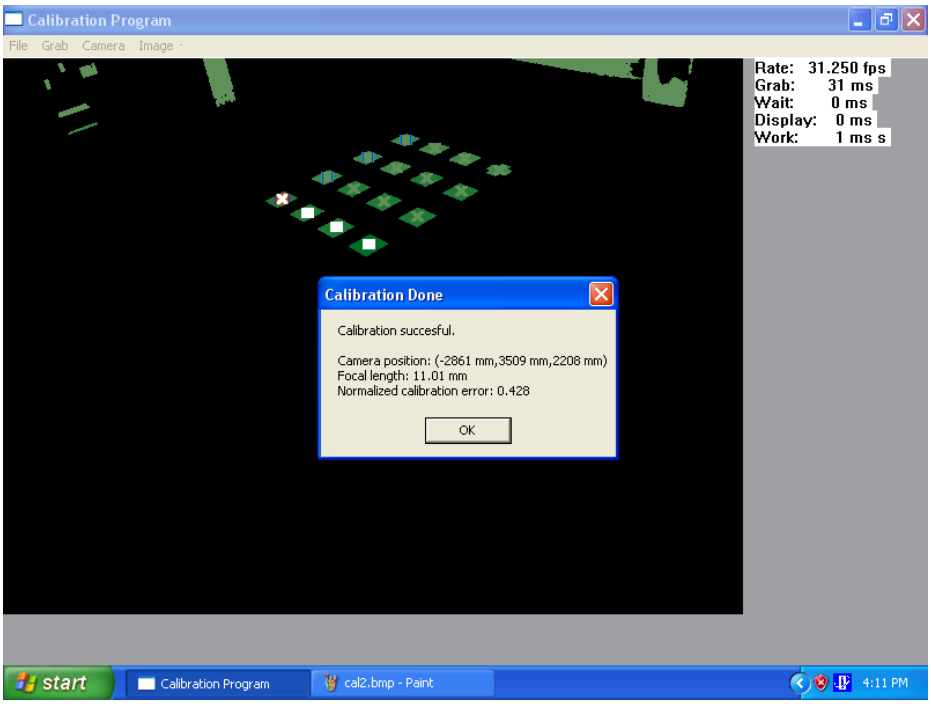
Camera 1



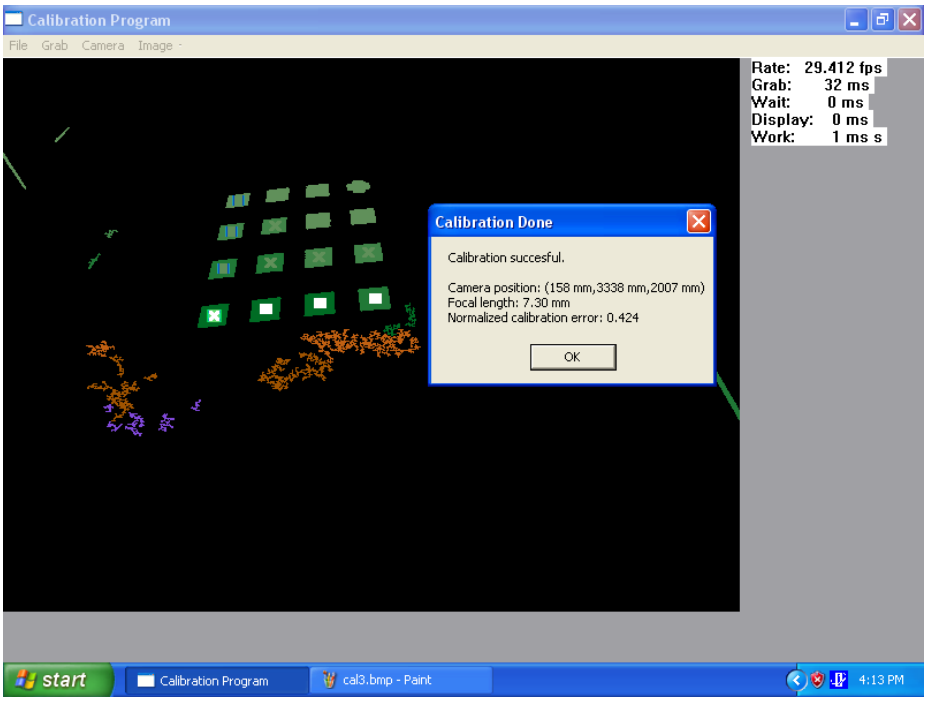
Camera 2



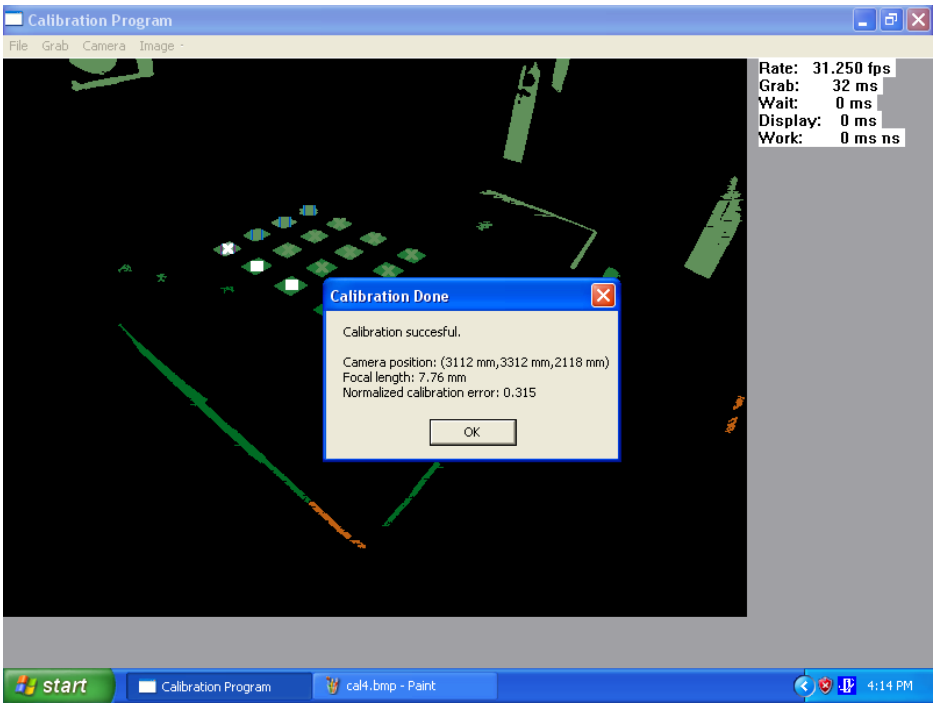
Camera 3



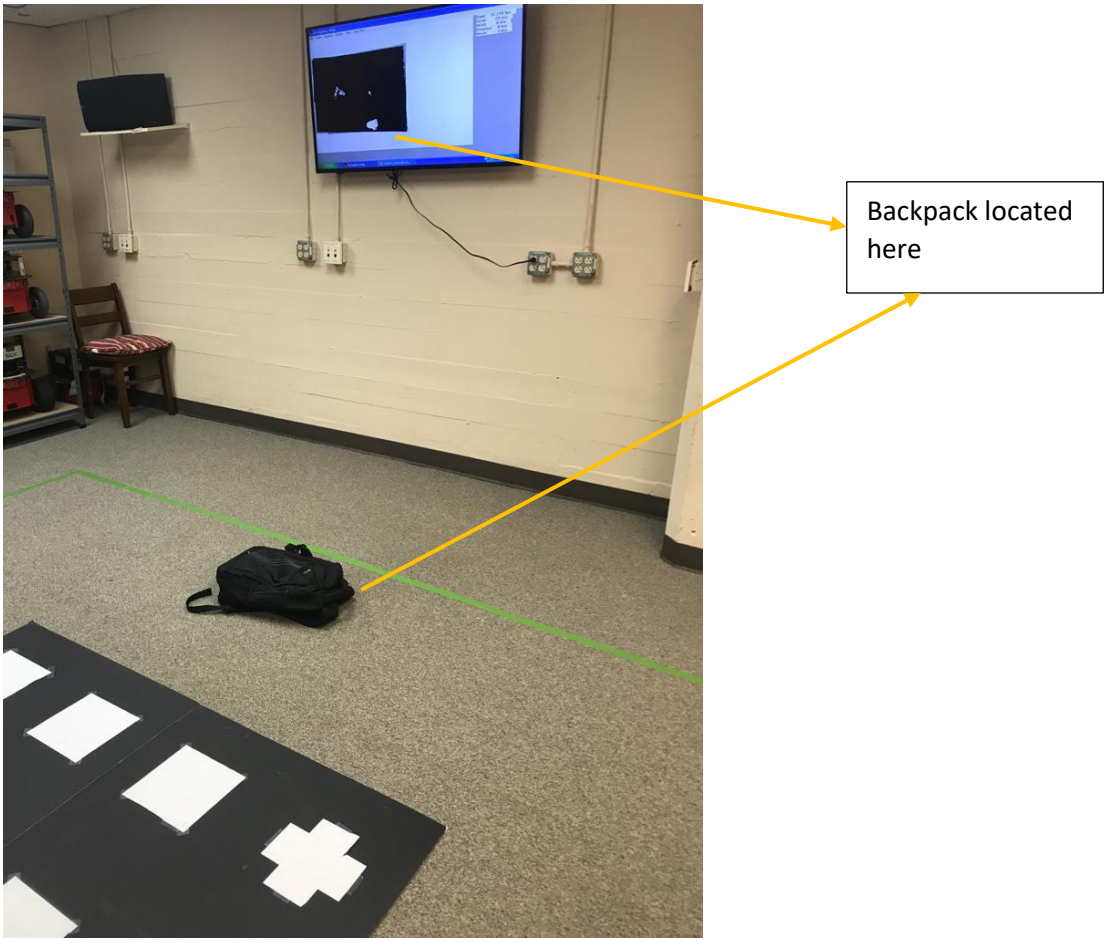
Camera 4



Camera 5



TRACKING Example Image



NOTE:

Since the x-axis is aligned with the back wall where TV is mounted, a backpack placed on that end would appear to be at the bottom of the calibrated image on the screen. If the grid were flipped to the opposite end of the wall (with respect to TV), the current position of the backpack would be located at the top end of the image.