

# Stereo Calibration & Rectification

*EcEn 631 - Assignment 3 - Luke Newmeyer*

## Task 1 - Camera Calibration

The following parameters result from the calibration sequence.

```
left_intrinsic =  
    [1714.270724585294, 0, 321.2806862604946;  
     0, 1716.706289569782, 239.035723641794;  
     0, 0, 1]  
left_distortion =  
    [-0.5242307504082864;  
     1.942800283150367;  
     0.003262996275105854;  
     0.0007524107824279429;  
     -75.05338294718617]  
right_intrinsic =  
    [1704.847102197011, 0, 342.6644077012681;  
     0, 1710.419142697755, 198.9258387215744;  
     0, 0, 1]  
right_distortion =  
    [-0.6061253457631722;  
     2.035805261164445;  
     0.00955434274012407;  
     -0.005349324783314255;  
     -13.38421695256111]
```

## Task 2 - Stereo Calibration

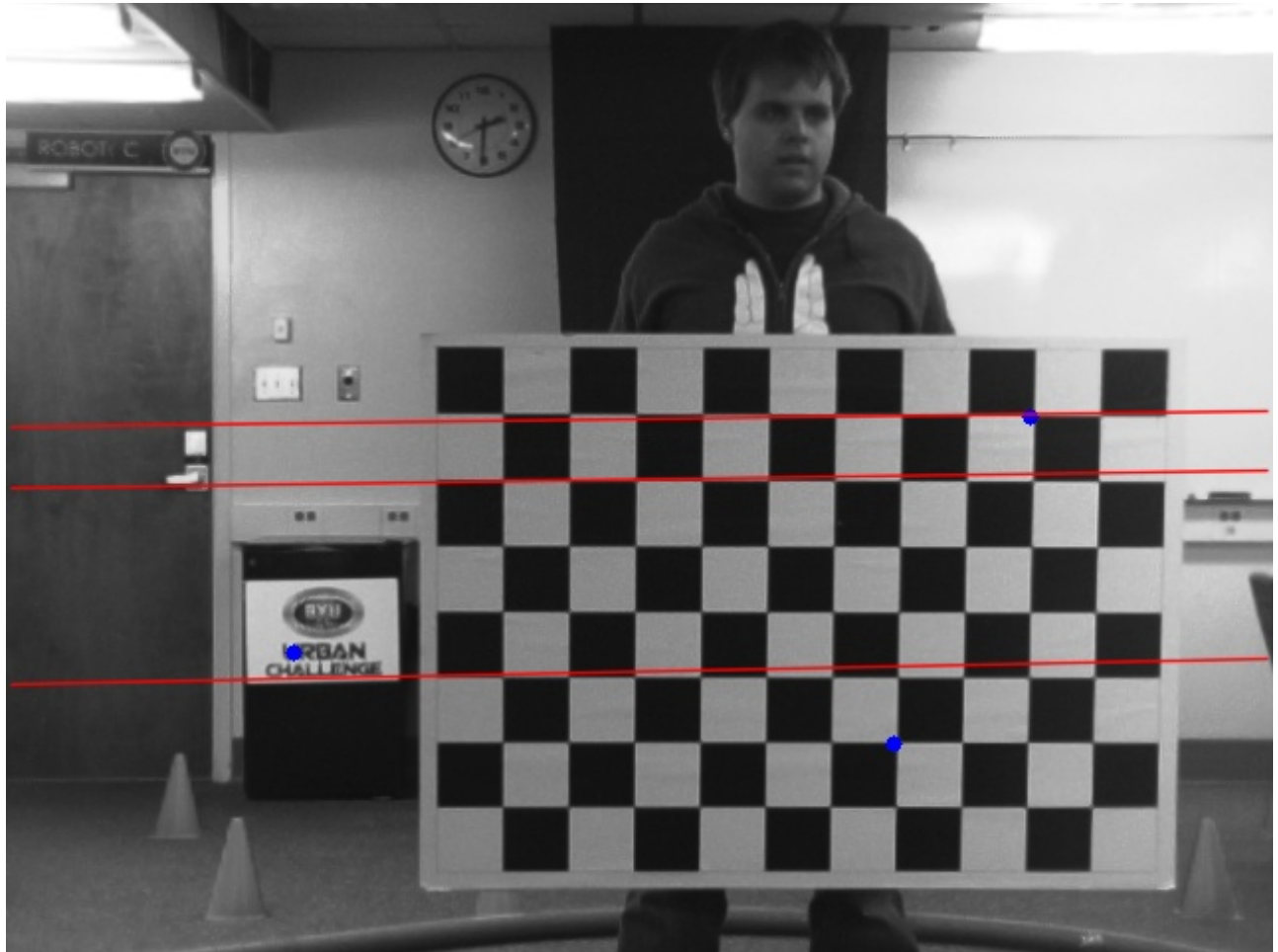
The stereo calibration parameters computed for this camera are as follows.

```
rotation =  
  [0.9966823810378338, 0.01065363919326174, 0.08068910273818986;  
   -0.01249020748797929, 0.9996735085380728, 0.02229060439034776;  
   -0.08042528237850077, -0.02322447629376306, 0.9964900389141975]  
translation =  
  [-42.06788017711337;  
   1.000731405102621;  
   -1.016466645135027]  
essential =  
  [-0.09317998514275888, 0.9928933146598263, 1.01987653267606;  
   -4.396415538427995, -0.987833554791488, 41.83820577317025;  
   -0.4719748076254209, -42.06480680473349, -1.018466593728245]  
fundamental =  
  [1.378481943922406e-07, -1.466778183599968e-06, -0.002280133707786704;  
   6.482761831091911e-06, 1.454549538167938e-06, -0.1081886126197161;  
   -0.0001464525152421925, 0.106154782731557, 1]
```

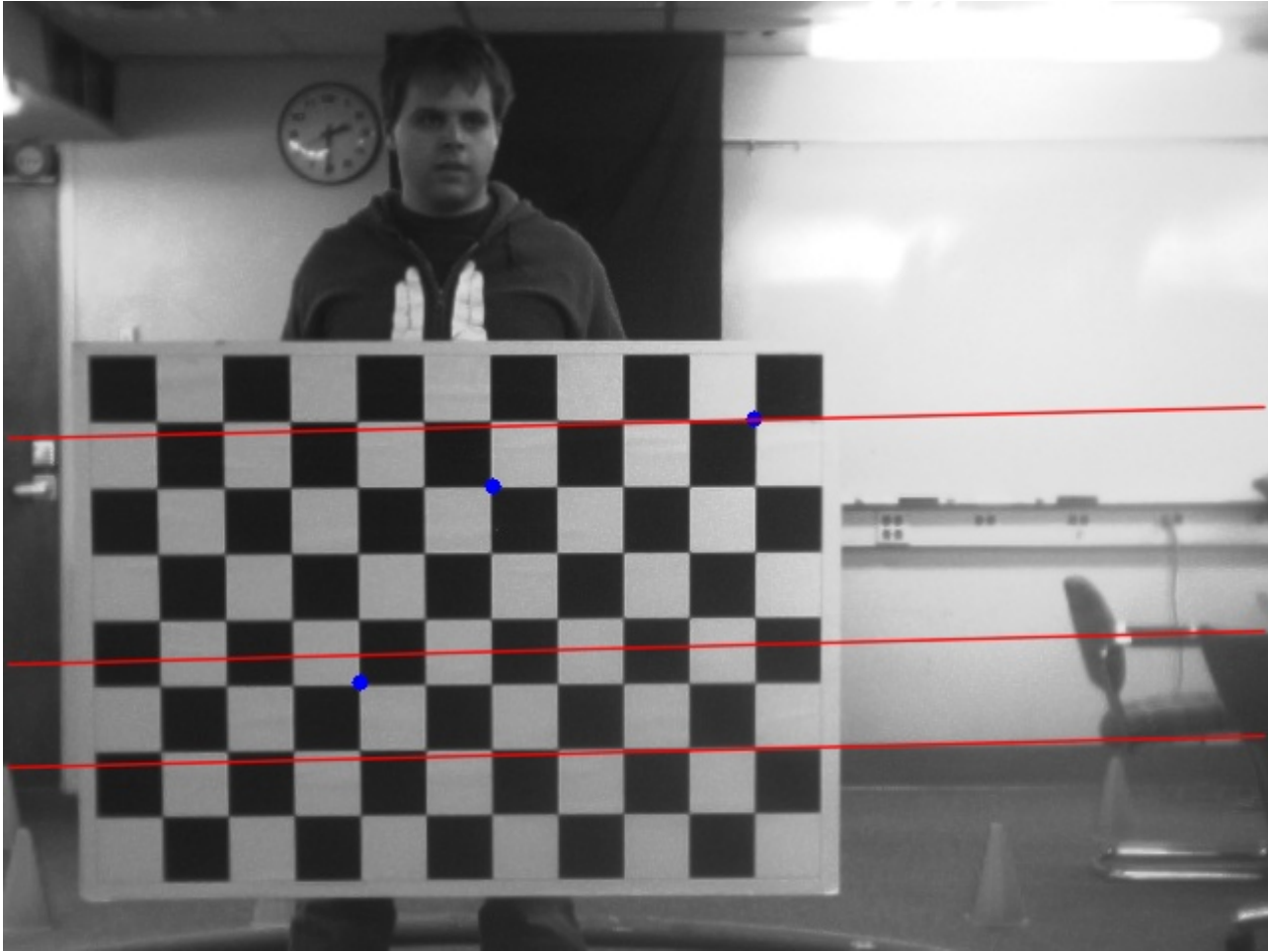
## Task 3 - Epipolar Lines

The following are the epipolar lines produced by the calibration.

### Left Epipolar Lines



Right Epipolar Lines



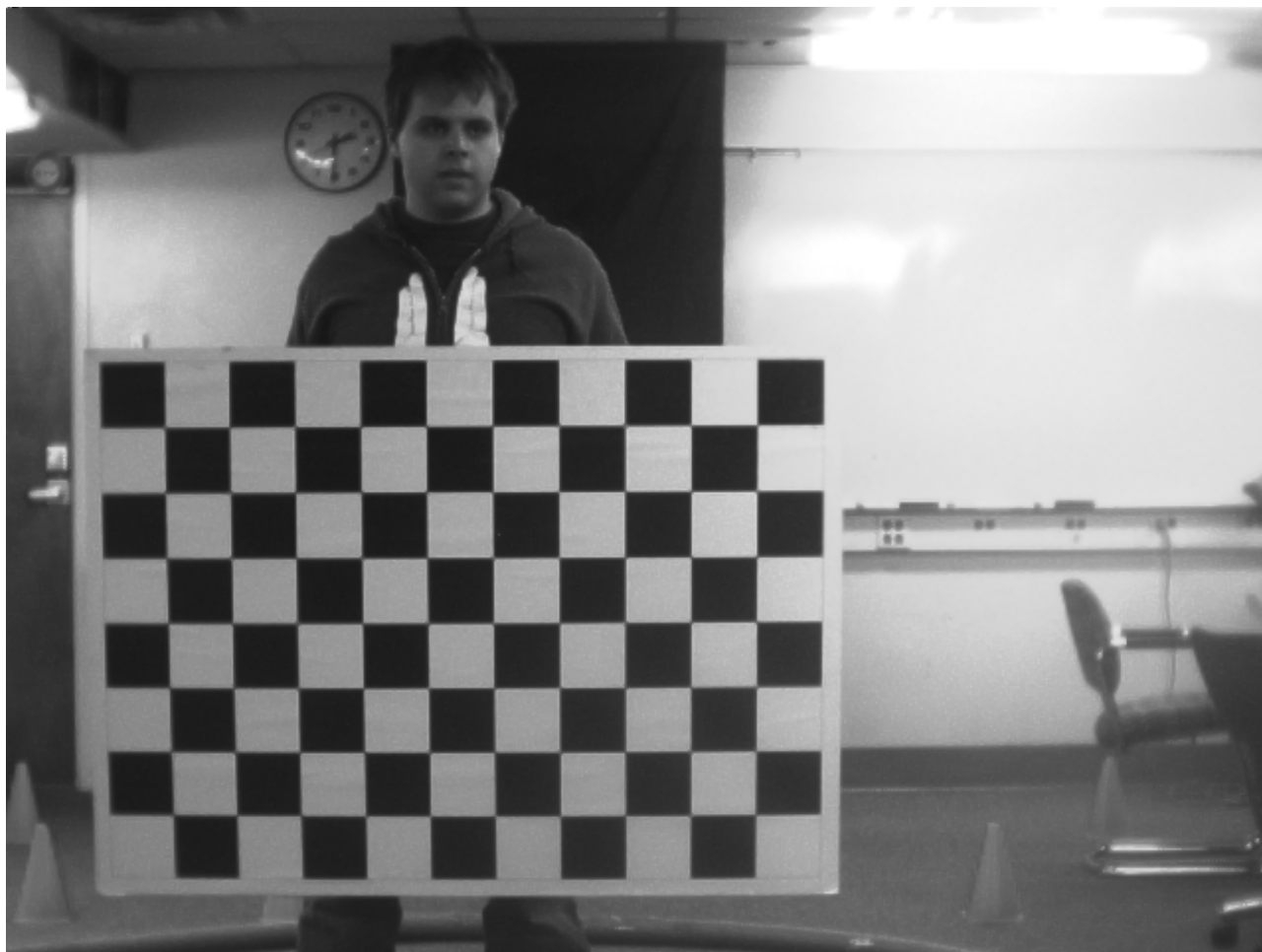
## Task 4 - Rectification

The following are the results of image rectification for the stereo system.

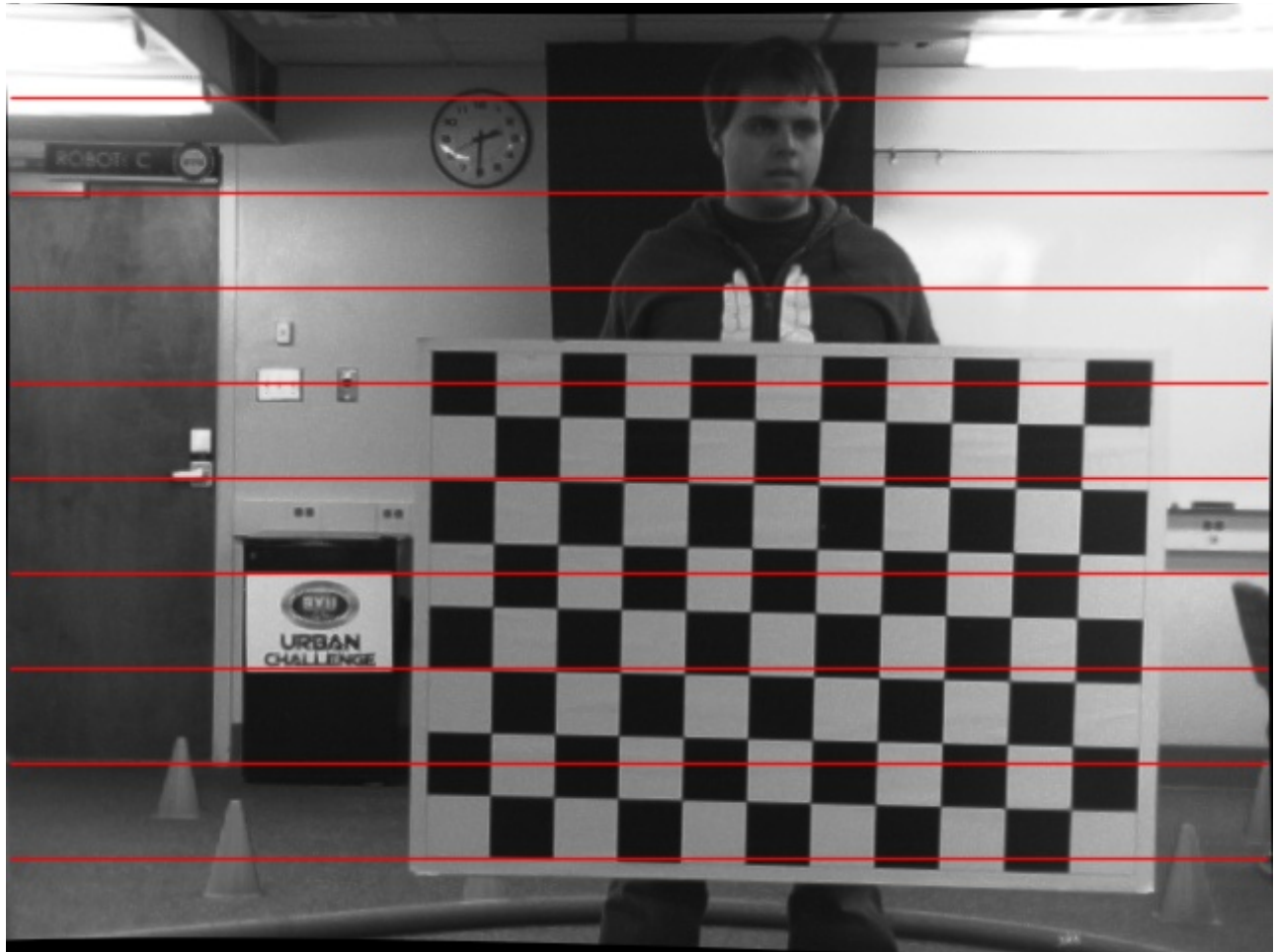
Left Original Image



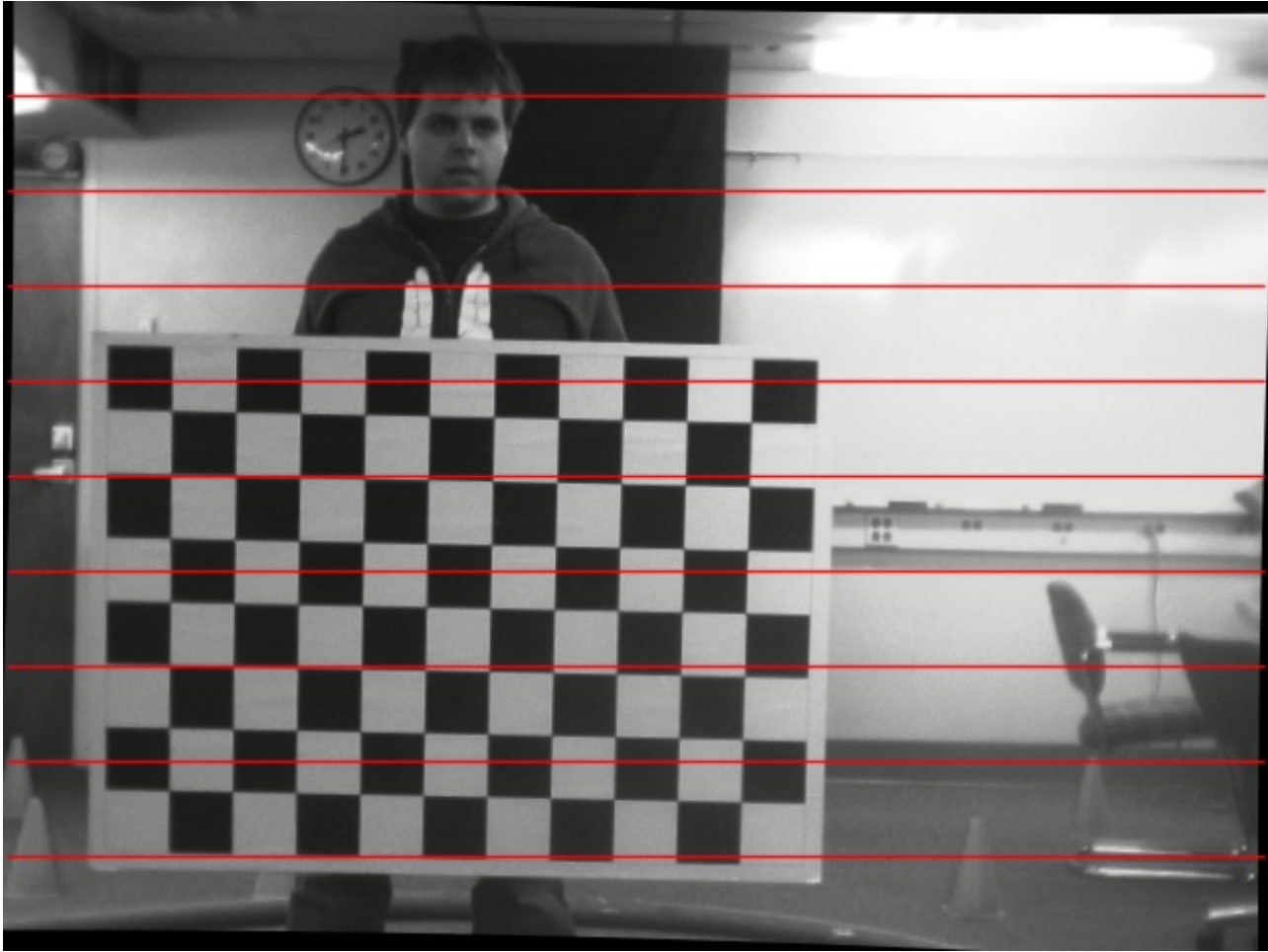
Right Original Image



Left Rectified Image

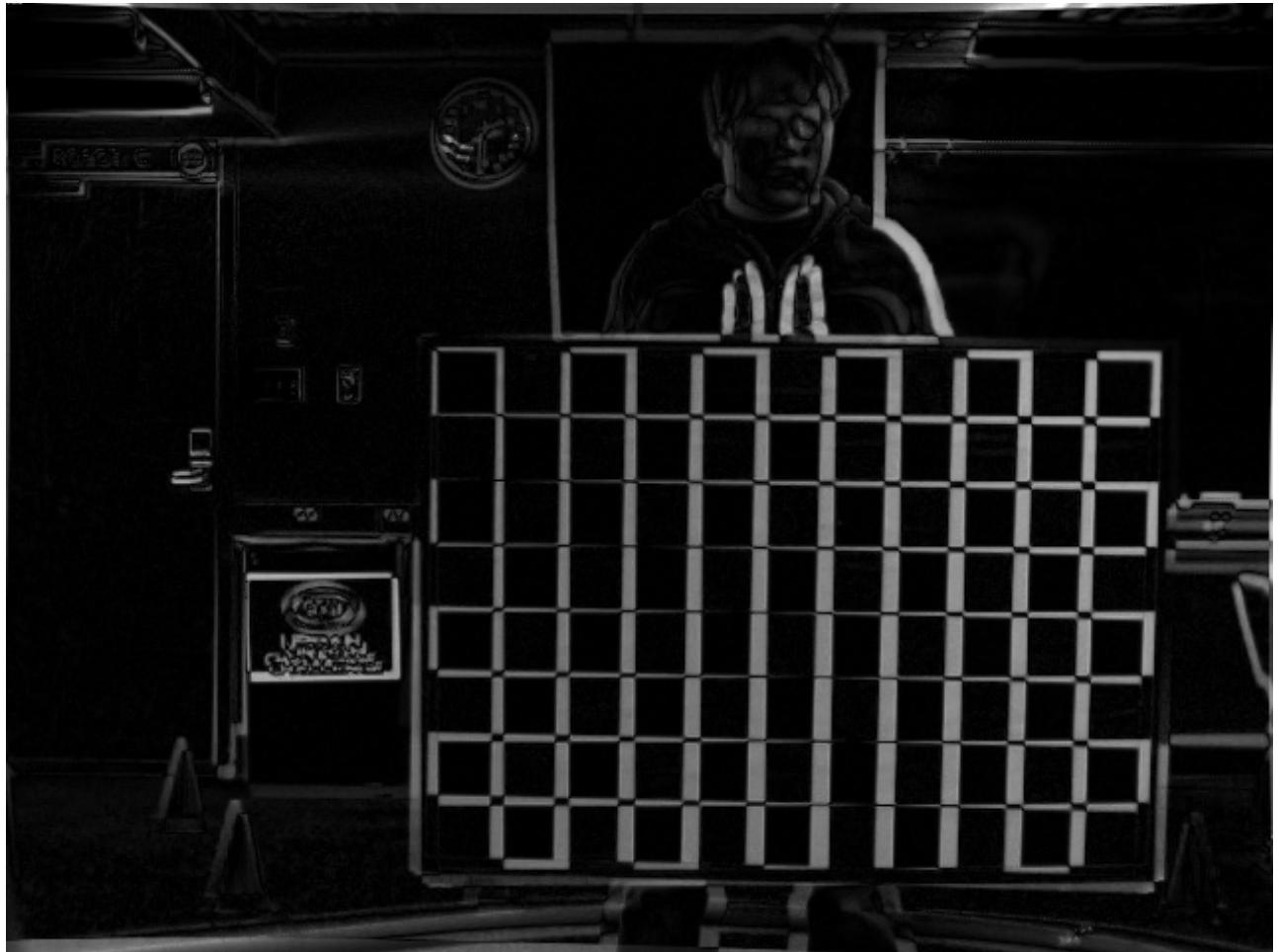


Right Rectified Image



Left Absolute Difference





Right Absolute Difference

