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CS4495 OMS
PS3

1.a.

Calibration matrix for normalized set:

```
[[-0.45827554 0.29474237 0.01395746 -0.0040258 ]  
 [ 0.05085589 0.0545847  0.54105993 0.05237592]  
 [-0.10900958 -0.17834548 0.04426782 -0.5968205 ]]
```

Last point <u,v>

```
[ 0.14190608 -0.45184301]
```

Residual of last point

0.00156214

1.b.

Average Residuals

Sample size 8

0.575907382113

2.22899387998

31.8265699067

0.479847699966

5.20361456022

3.61242647602

0.660813358469

8.94162259576

0.292178113513

1.02557095042

Sample size 12

0.266682973361

5.20198548059

0.296978815963

1.62194051714

0.496179666281

1.46958119815

2.94644093981

4.97655001456

0.368299855309

0.321070890435

Sample size 16

7.9476211229

1.39603831196

1.06176556916

0.659281965968

0.351722239968

0.491647181555

0.376260318237

1.52115780154

0.454279925979

7.21816777304

I ran the trials multiple times and found that every time some of the average residuals were very high. Sometimes the high residual would correspond to the sample size of 8, sometimes the 12 and sometimes the 16. It also seemed that the matrix with the best test sample size was not always from the same sample size. It seems to me that perhaps the test size is too small to get good feedback. I tried normalizing the values, but did not have improved results.

Best matrix for this run:

residual:0.266682973361,

matrix:

```
[[ 2.94025059e-06 -2.18644585e-05 -3.15313867e-03  9.95213289e-01]
 [ 3.11020740e-07 -2.46158631e-06 -3.09117452e-04  9.76220835e-02]
 [ 1.06821453e-08 -7.04692448e-08 -1.02203830e-05  3.22485024e-03]]
```

1.c.

center (as calculated by the matrix with the best residual):

$\begin{bmatrix} 762.03795613 & 232.18599641 & 314.7268022 \end{bmatrix}$

2.a.

Fundamental Matrix:

$\begin{bmatrix} -6.60698417e-07 & 7.91031621e-06 & -1.88600198e-03 \\ 8.82396296e-06 & 1.21382933e-06 & 1.72332901e-02 \\ -9.07382302e-04 & -2.64234650e-02 & 9.99500092e-01 \end{bmatrix}$

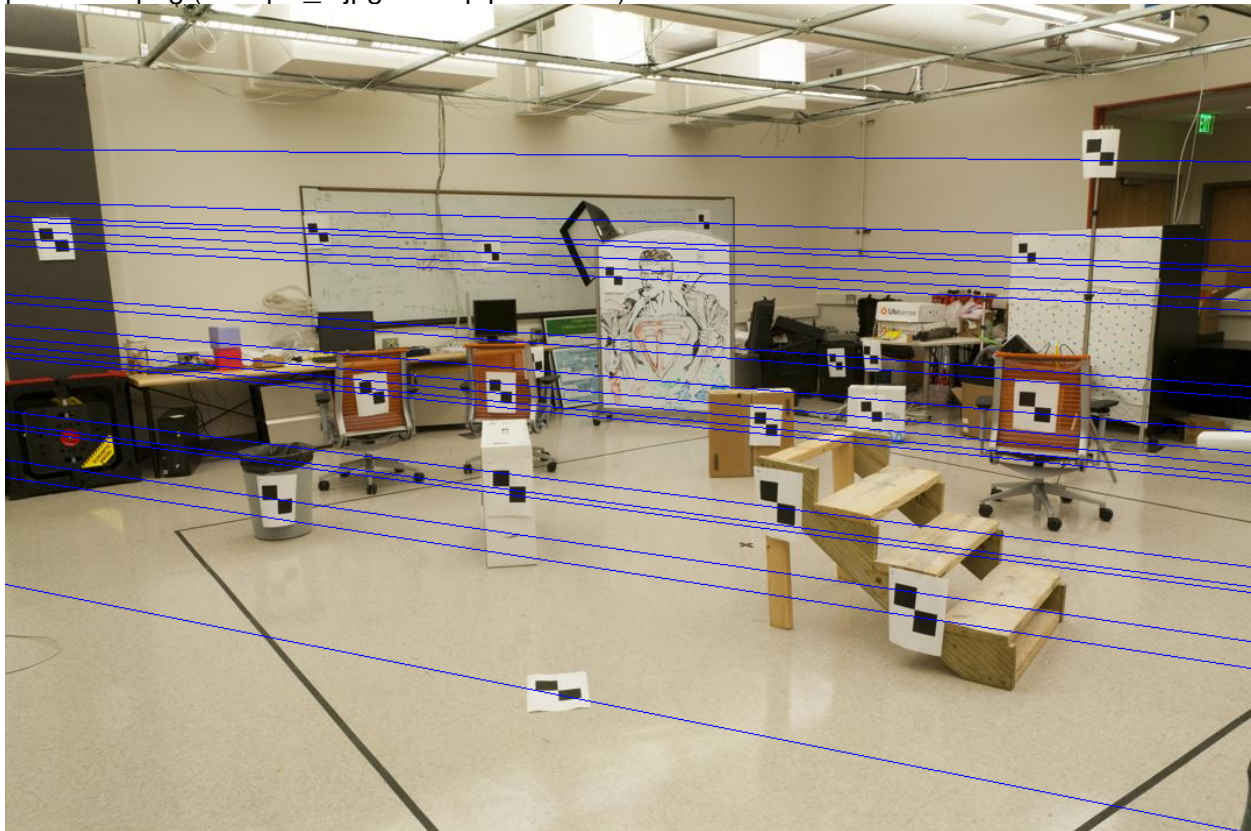
2.b.

Fundamental Reduced:

$\begin{bmatrix} -5.36264198e-07 & 7.90364771e-06 & -1.88600204e-03 \\ 8.83539184e-06 & 1.21321685e-06 & 1.72332901e-02 \\ -9.07382264e-04 & -2.64234650e-02 & 9.99500092e-01 \end{bmatrix}$

2.c.

ps3-2-c-1.png (from pic_a.jpg with epipolar lines)



ps3-2-c-2.png (from pic_b.jpg with epipolar lines)

