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Homework 3

Questions

1. camL.f = 1.6985e+03   camR.f = 1.6687e+03
   camL.c = [800;600]   camR.c = [800;600]
   camL.t = [47.0899; 40.0614; 55.4310]   camR.t = [26.6248; 50.9893; 55.0973]

   $$camL.R = \begin{bmatrix} -0.6842 & 0.4976 & -0.5331 \\ 0.7286 & 0.4985 & -0.4698 \\ 0.0320 & -0.7099 & -0.7036 \end{bmatrix} \quad camR.R = \begin{bmatrix} -0.9291 & 0.2611 & -0.2618 \\ 0.3698 & 0.6490 & -0.6649 \\ -0.0037 & -0.7146 & -0.6996 \end{bmatrix}$$

   baseline = Euclidean distance (camL.t – camR.t) = 23.2024 cm

2. My average error calculated using MSE is 0.0159 cm off . This might be because of bad initial guesses for the parameters, or because of inaccurate clicking on the corner points.

3. focal length in mm = (focal length in pixels * CCD width in mm) / image width in pixels

   using left camera:
   f = (1698.5 * 5.75) / 1600 = 6.103984375

   using right camera:
   f = (1668.7 * 5.75) / 1600 = 5.996890625

   It is reasonable. When comparing it to the exif data on the calibration pictures, it is within +/- 1 of the given focal length.