EN2550 Exercise 9 on Structure from Motion

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The Middlebury Multi-View Stereo dataset contains calibrated image. Read the webpage and download the TempleSparseRing [1] dataset, if you have not done so in the last exercise. As done last week, read in the templeSR_par.txtg and populate the parameters of K_i R_i and $\boldsymbol{t}_i$ for $i = 1, 2$. Compute the camera matrices P_i for $i = 1, 2$.

1. Find SIFT features in the two images (sift = cv.xfeatures2d.SIFT_create()) and match them using the Flann-based descriptor matcher.
2. Compute the fundamental matrix F and the essential matrix E.
3. Use recoverPose method to recover the pose of the second camera with respect to the first, i.e., R and $\boldsymbol{t}$
4. Computer the cameras matrix P_2. (Disregard that we already have this from the dataset.)
5. Find the 3-D point locations using triangulatePoints method. Plot these points.

Upload the pdf generated form the Jupyter notebook as your_index_ex09.pdf. The report must include important parts of code, image results, and comparison of results.

[1] https://vision.middlebury.edu/mview/data/data/templeSparseRing.zip