Assignment 3 – part 1

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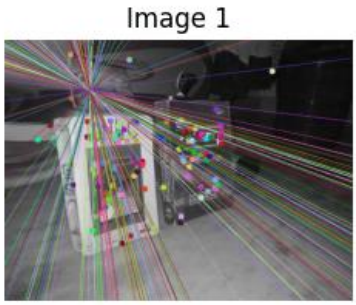
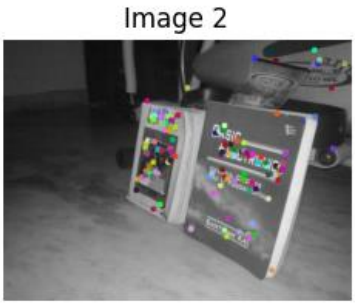
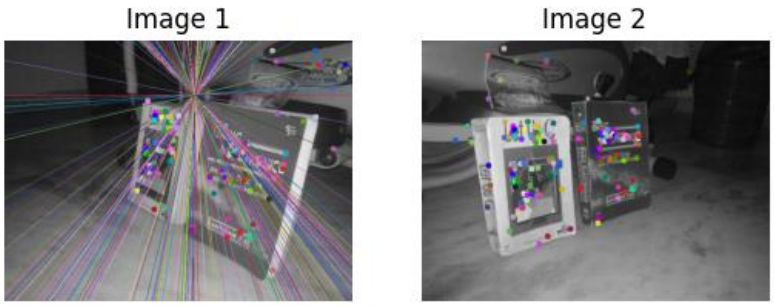
These key points are matched across the two images, meaning they correspond to the same physical points in the scene observed from two different viewpoints.
Each epipolar line in one image corresponds to a point in the other image. According to the epipolar geometry, for each point in one image, there exists a line in the other image where the corresponding point must lie. This is based on the constraint that the point in the scene, the point's image in one view, and the camera's center of the other view must be collinear.
In Image 1, each line corresponds to a point in Image 2, and vice versa. The intersection of the lines in Image 1 would be the epipole if all lines were extended; the same goes for Image 2.

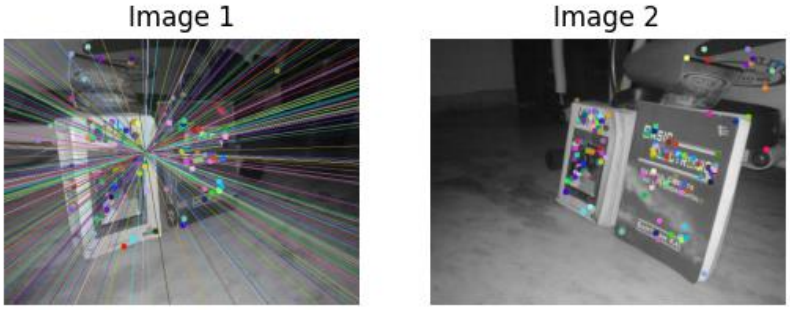
For myleft.jpg and myright.jpg:
Fundamental Matrix computed by built-in OpenCV function:
[[1.30641075e-05 1.81469372e-05 -3.61598352e-03]
 [-2.57610069e-05 1.90964867e-05 2.13267906e-03]
 [-1.84595603e-03 -7.93465809e-03 1.00000000e+00]]
My computed Fundamental Matrix:
[[1.30641075e-05 1.81469372e-05 -3.61598352e-03]
 [-2.57610069e-05 1.90964867e-05 2.13267906e-03]
 [-1.84595603e-03 -7.93465809e-03 1.00000000e+00]]

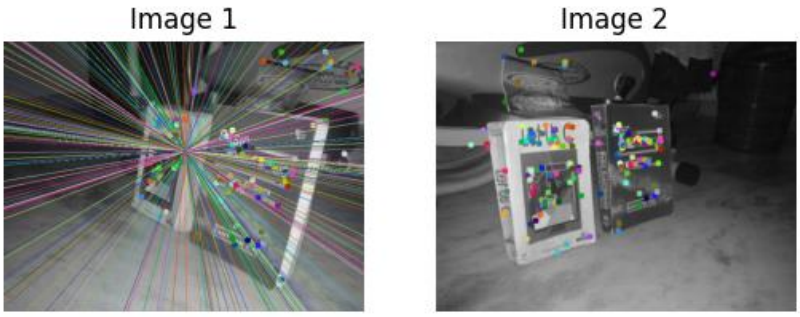






My computed RANSAC Fundamental Matrix:
[[6.51525545e-06 1.59418449e-05 -4.73910904e-03]
 [-1.38762783e-05 4.74145124e-06 2.43969951e-03]
 [6.02587110e-04 -5.79718726e-03 1.00000000e+00]]





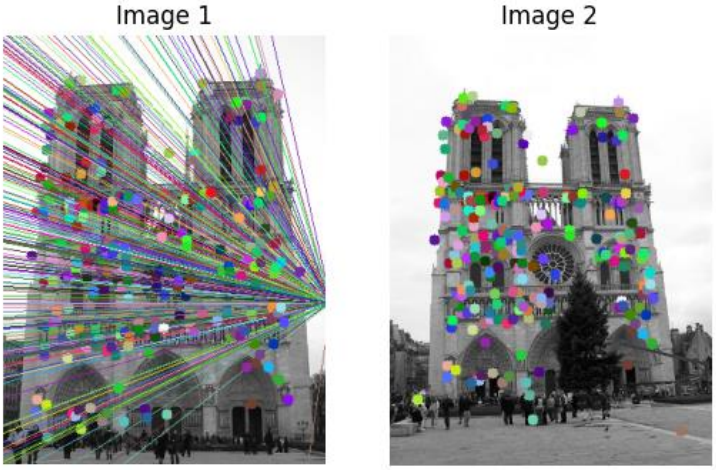
For notredam_1.jpg and notredam2.jpg:

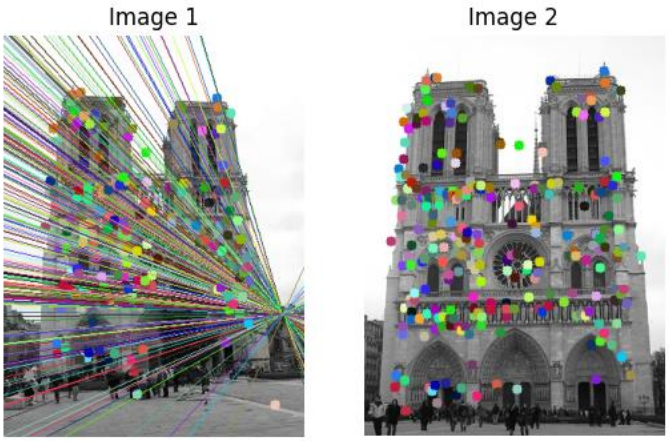
Fundamental Matrix computed by built-in OpenCV function:

[[1.43824939e-04 5.82103337e-04 -1.94254472e-01]
 [-5.86388808e-04 -3.12812932e-05 1.91403923e-01]
 [1.24757087e-01 -1.56040682e-01 1.00000000e+00]]

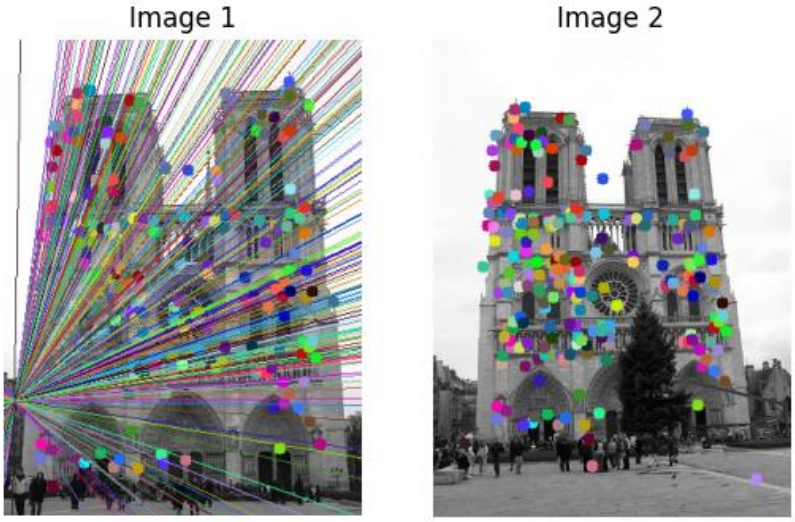
My computed Fundamental Matrix:

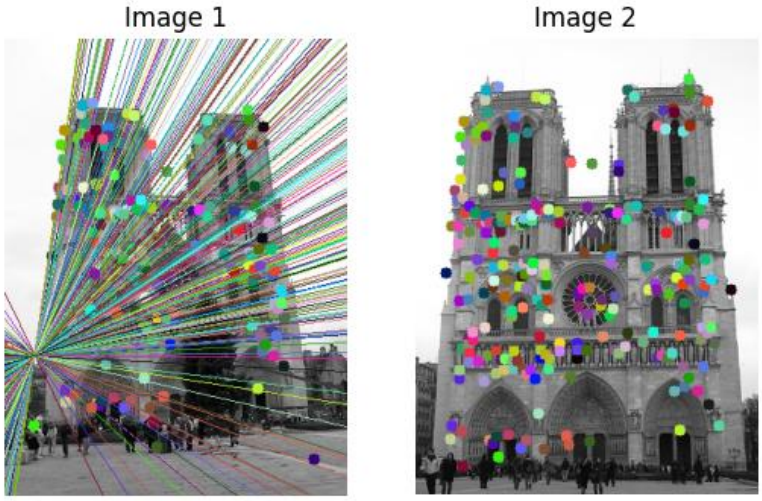
[[1.43824939e-04 5.82103337e-04 -1.94254472e-01]
 [-5.86388808e-04 -3.12812932e-05 1.91403923e-01]
 [1.24757087e-01 -1.56040682e-01 1.00000000e+00]]





My computed RANSAC Fundamental Matrix:
[[-2.89614339e-06 1.90373144e-04 -5.92904403e-02]
 [-1.97300231e-04 -9.26658580e-07 2.05860488e-03]
 [5.58023618e-02 -4.81601776e-03 1.00000000e+00]]





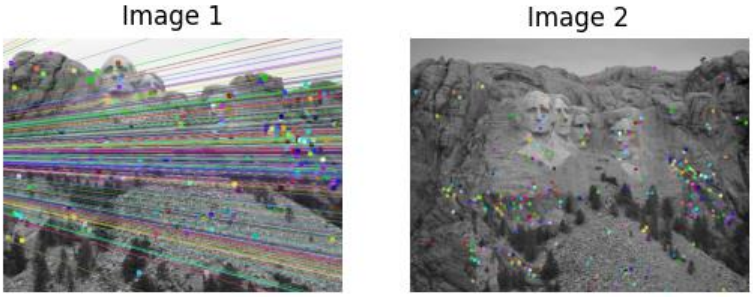
For mount_rushmore_1.jpg and mount_rushmore_2.jpg:

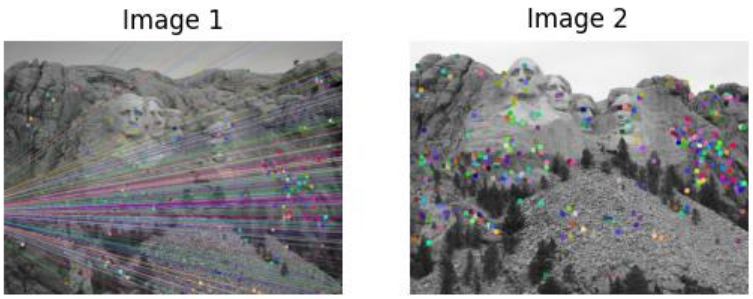
Fundamental Matrix computed by built-in OpenCV function:

[[-6.21019078e-07 1.94057859e-05 -4.61012984e-03]
[-9.63274968e-06 -3.36322689e-06 -3.39544243e-03]
[4.69881036e-03 4.57321966e-03 1.00000000e+00]]

My computed Fundamental Matrix:

[[-6.21019078e-07 1.94057859e-05 -4.61012984e-03]
[-9.63274968e-06 -3.36322689e-06 -3.39544243e-03]
[4.69881036e-03 4.57321966e-03 1.00000000e+00]]





My computed RANSAC Fundamental Matrix:
[[4.23363218e-07 -1.61855242e-05 3.04079474e-03]
 [1.36851895e-05 3.85121297e-06 -8.06035849e-03]
 [-6.00691061e-03 1.08867563e-02 1.00000000e+00]]

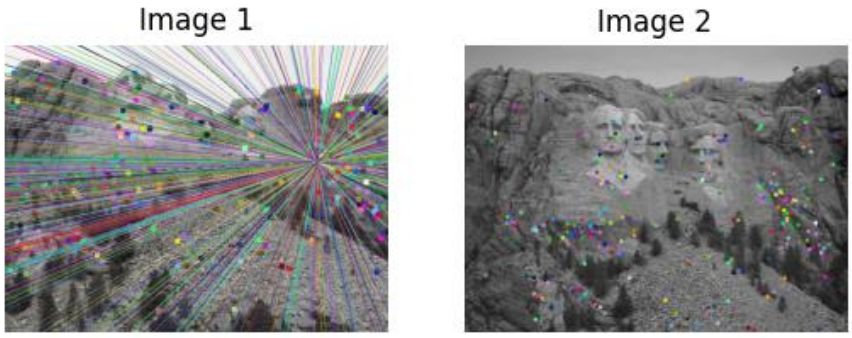


Image 1

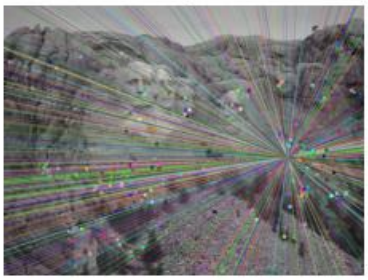


Image 2