CENG 391 Introduction to Image Understanding

29 December, 2016

Homework 5

Due Date: 22 January 2017, 23:55

Programming Assignment — Epipolar Line Visualization Tool

In this assignment, you should write C++/Python code for visualizing epipolar lines.

1. Read two given input images.
2. Determine keypoint detector and descriptor extractor algorithm.(ORB or SIFT)
   — **Hint:** Use detectAndCompute() method of OpenCV.
3. As a first, detect keypoints and compute their descriptors in both images.
4. Find correspondences between images based on descriptors by assigning the nearest neighbour as a correspondence.
5. Implement the algorithm manually which is explained in LAB-11 (Step[4-6]) and find the fundamental matrix and its inliers.
6. Then with these inliers, by applying normalized 8-point algorithm estimate fundamental matrix again and update the inliers.
7. Run step 6 until the number of inliers converges.

8. **Visualization Tool**

   (a) Concatenate two input images as you did in HW1.

   (b) You should have two important constraints:
   — You should allow to select points only on the first image and draw a circle on that location.
   — You should draw epipolar line correspondence of the point on the second image.

Your tool can draw epipolar lines as follows:

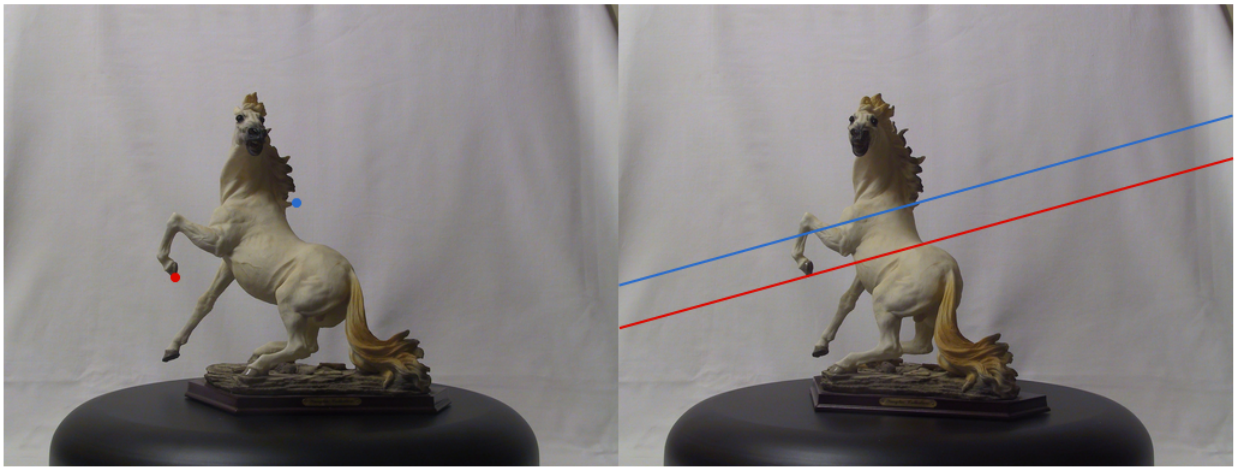

Figure 1: Expected output.