Mobile Robotics

2 View Sparse Reconstruction
Assignment - 3

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detectSurfFeatures is inbuilt matlab function used to detect feature points in the two images and is used to find the corresponding coordinates of matched features in both the images.

Next these points are passed on to function which uses 8 normalized points to find Fundamental Matrix. RANSAC is used to maximize the number of inliers with a threshold of 0.0005.

Further the Fundamental matrix is used to find the Essential Matrix using given Calibration Matrix and Rotation and Translation by using Algebraic Triangulation.

The final values of F, R and T are as shown:

```
Command Window

  The Fundamental Matrix is:
        0.0000      0.0001     -0.0201
       -0.0001      0.0000     -0.0742
        0.0230      0.0631      1.0000


  Rotation  matrix is given as:
        0.9907     -0.1149      0.0731
        0.1126      0.9930      0.0357
       -0.0767     -0.0272      0.9967

  Translation matrix is given as:
       -0.9054
        0.0096
        0.4244
```
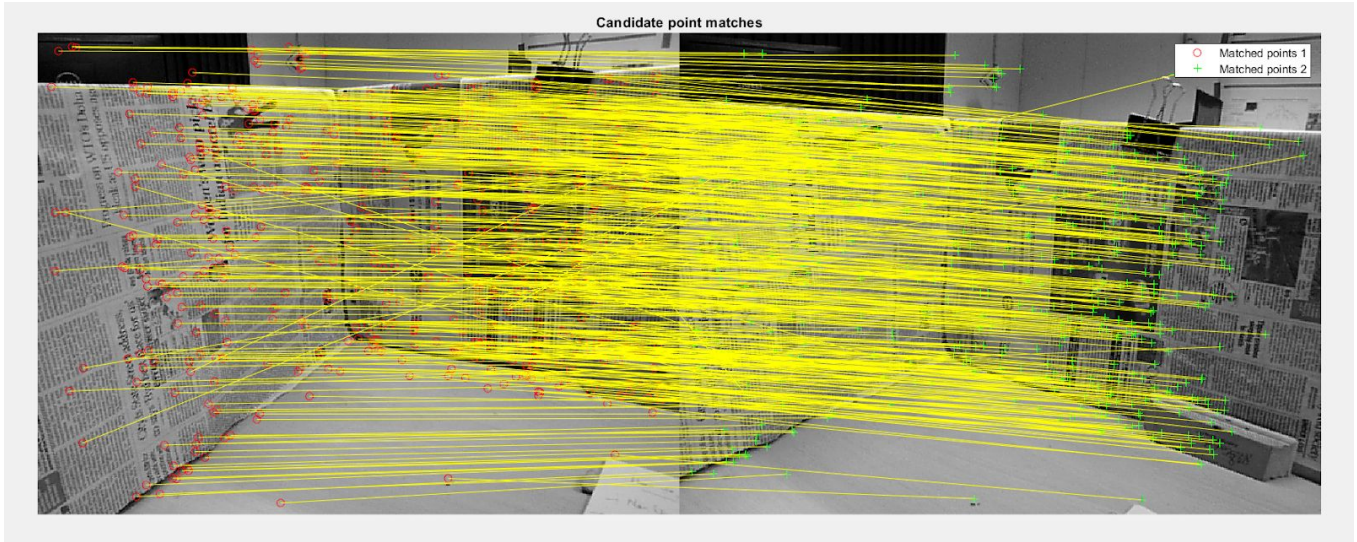
These values might slightly change because of random points.

Candidate point matches

The matched feature points of both the images are shown above in montage plot.

The reconstructed top view of the given object is shown below considering 250 inliers.