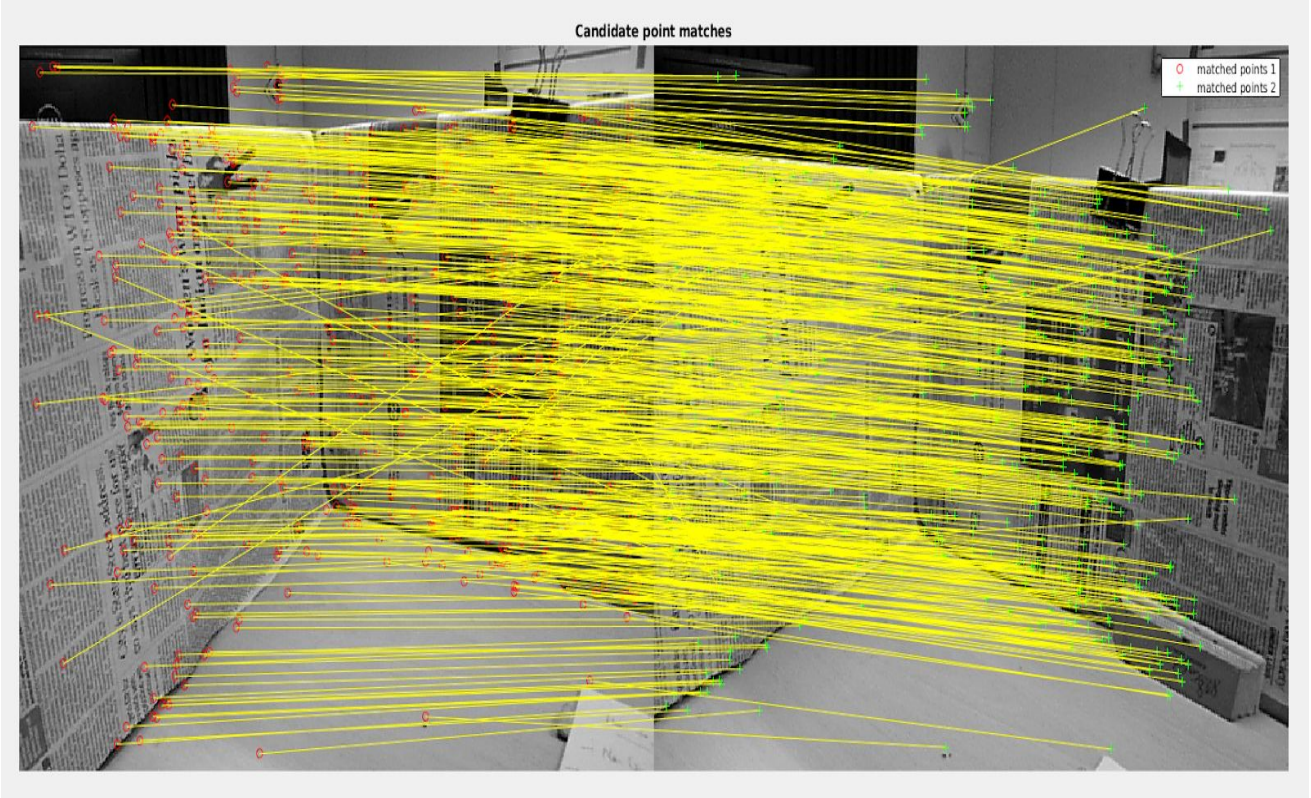
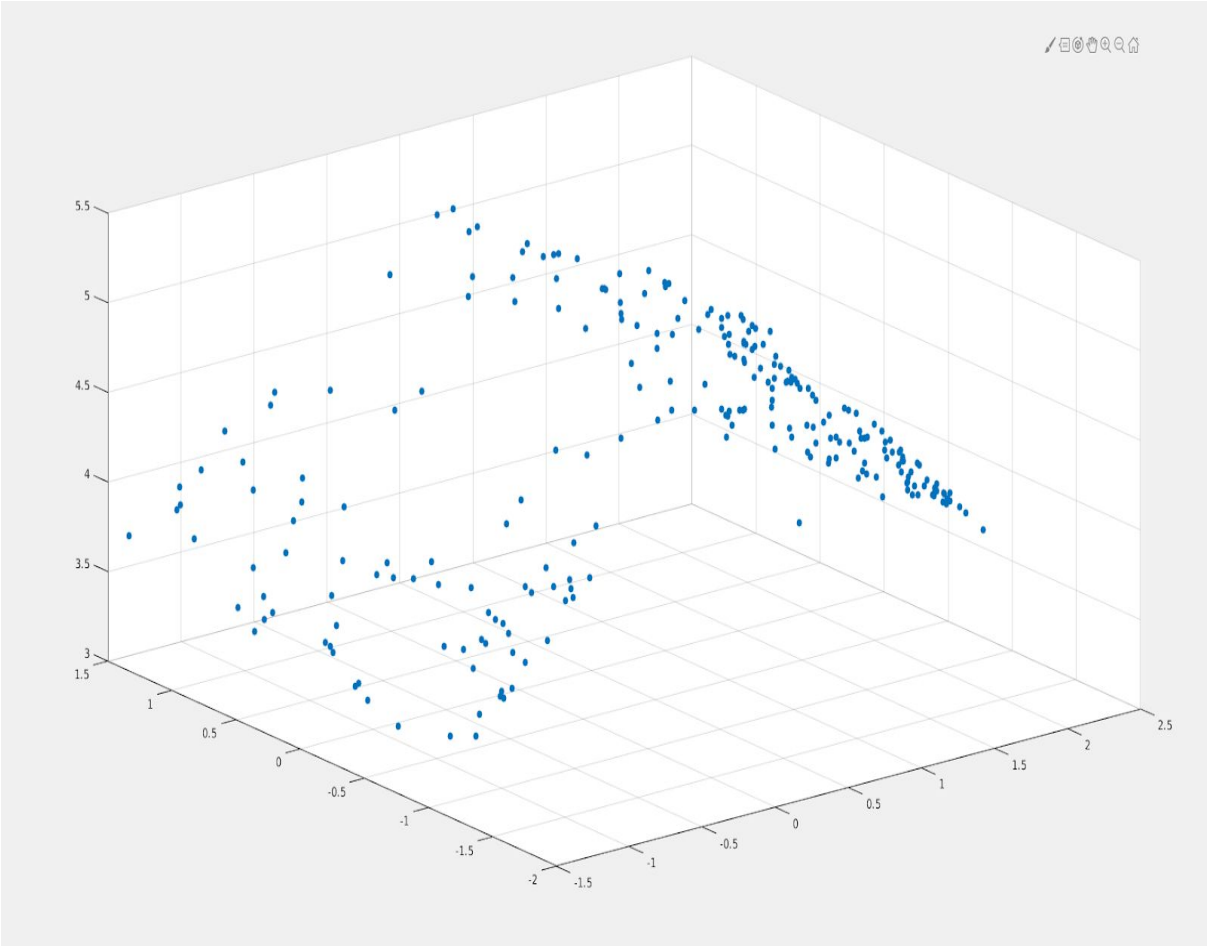
Mobile Robotics

Assignment - 3



Montage Showing two images and matched features



Final Result

```
The Fundamental Matrix is:
    0.0000    0.0001   -0.0171
   -0.0000    0.0000   -0.0728
    0.0204    0.0617    1.0000

Rotation  matrix is given as:
    0.9903   -0.1176    0.0739
    0.1152    0.9927    0.0357
   -0.0776   -0.0268    0.9966

Translation matrix is given as:
   -0.9242
    0.0122
    0.3817
```

Above are the final values of
Fundamental Matrix, Rotation Matrix and Translation Matrix

Steps -

1)*Extract corresponding points*

Using DetectSURFfeatures function

2)*Preconditioning the system*

Created a function for normalising the 2d points using the steps given and inbuilt functions mean and size.

3)*Compute Fundamental matrix*

Created a function estimate FundamentalMatrixRANSAC
To get the Fundamental Matrix.
Used a threshold of 0.0010 and 30000 iterations and 8 normalized points.

4)*Compute rigid body transform between cameras*

Found essential matrix and then computed R and T matrix

5)*Reconstruct the scene*

Created a function algebraicTriangulation using the steps given to us.

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