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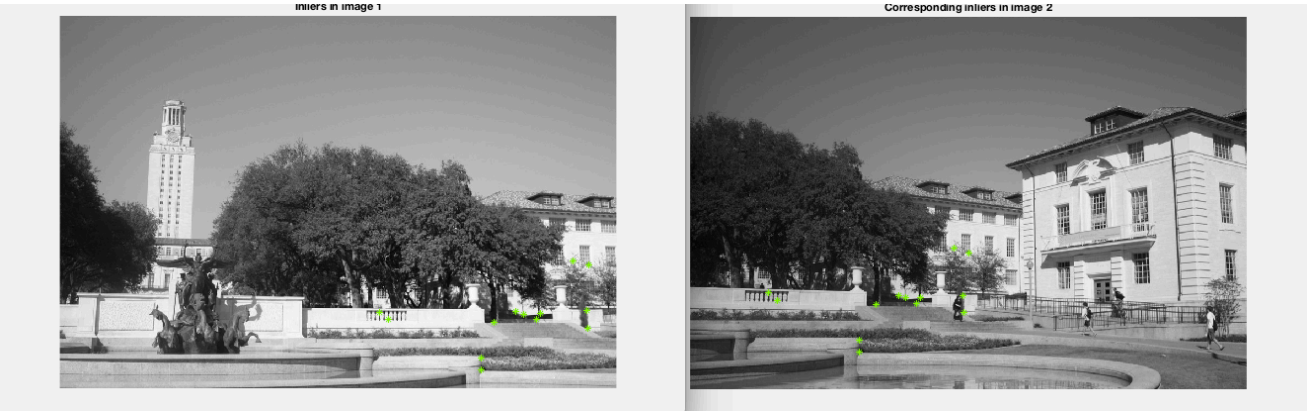
Course: CSE 573
Assignment: HW3

1. Homography Estimation

a. Solution:

- Feature extraction - Harris Corner Detector with sigma = 3 and thresh = 0.05
- Neighborhood - Works great with 49 x 49 neighborhood(neighborhood_depth = 3). 81 x 81 also works fine(neighborhood_depth = 4). Borders were replicated to handle feature points around the borders.
- Putative matching - Selected all descriptors with distances below 8 for putative matching.

b. Number of inliers: 22
Average Residual: 461031.1964



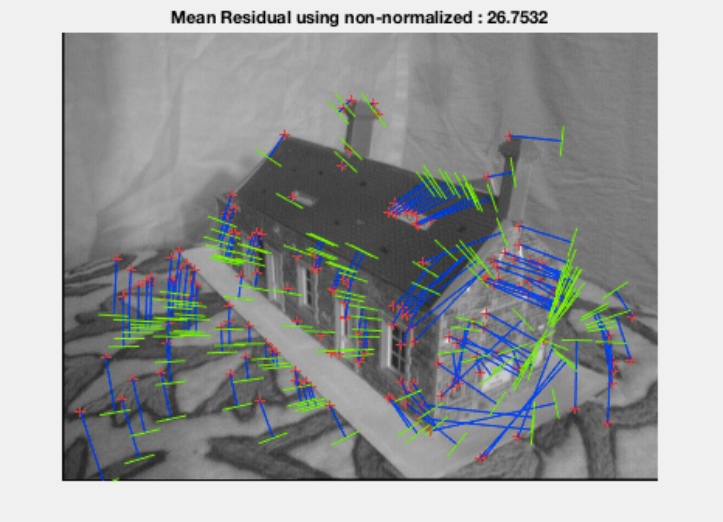
c. Final panorama:

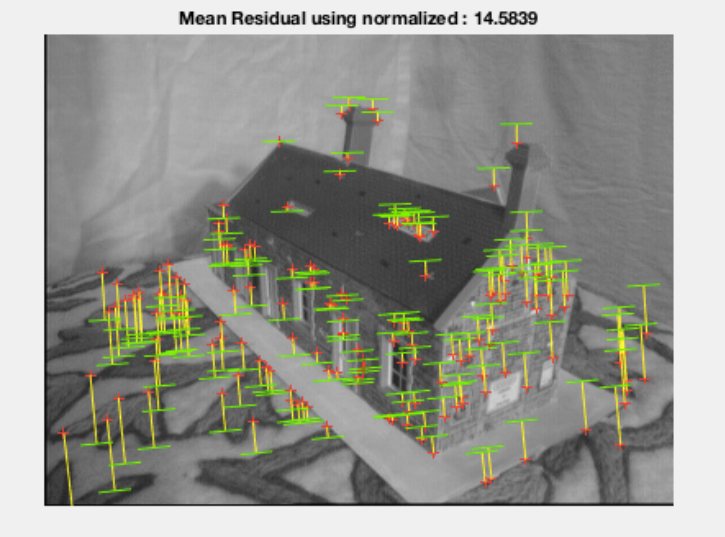
2. Fundamental Matrix Estimation

a. House:

i. Mean Residual (unnormalized) : 26.7532

ii. Mean Residual (normalized) : 14.5839

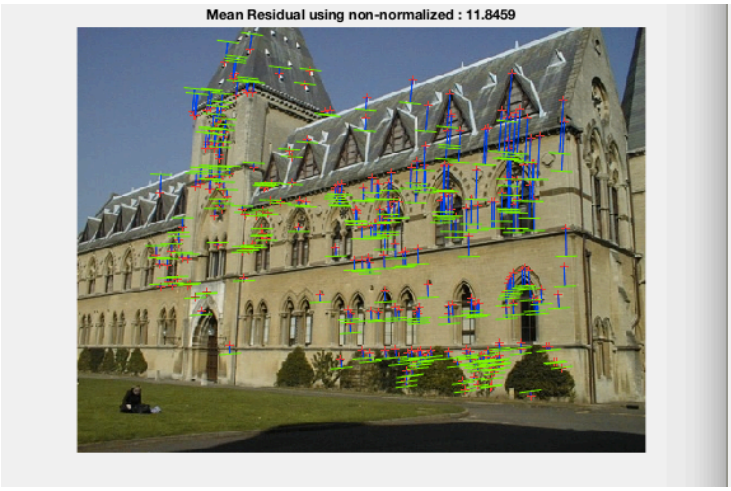


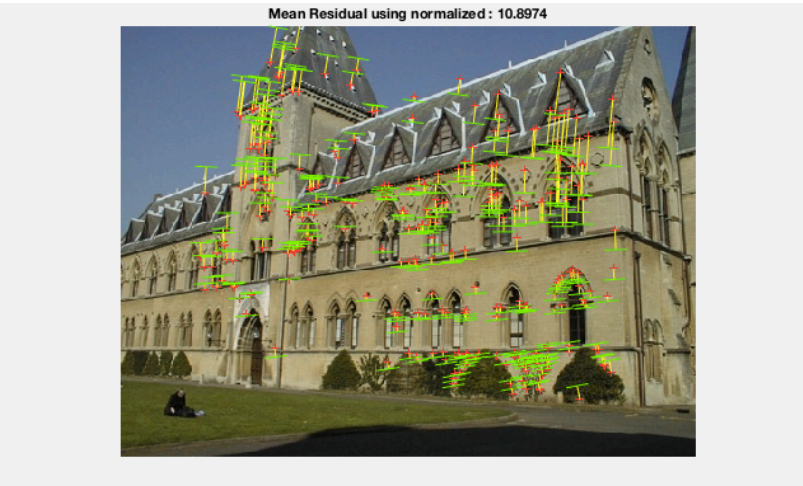


Library:

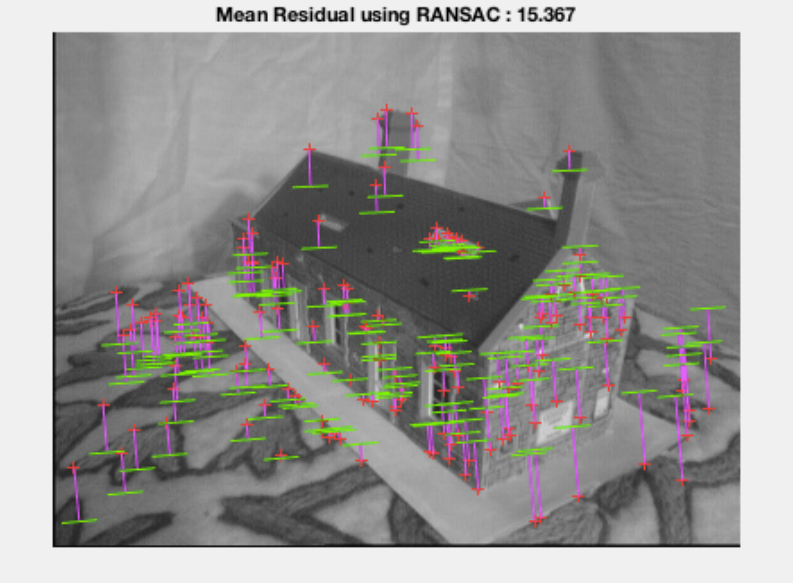
i. Mean Residual (unnormalized): 11.8459

ii. Mean Residual (normalized): 10.8974

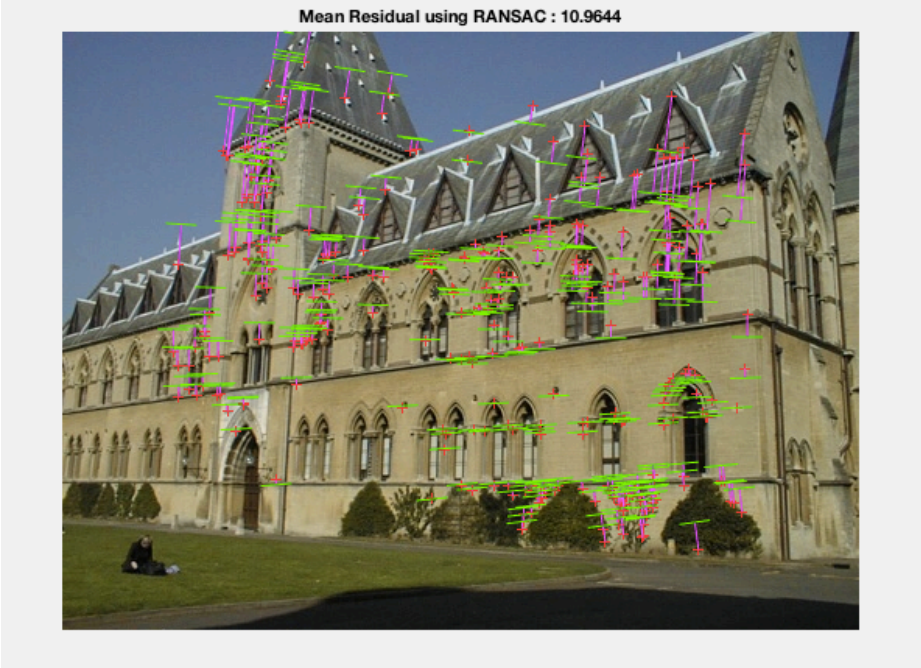




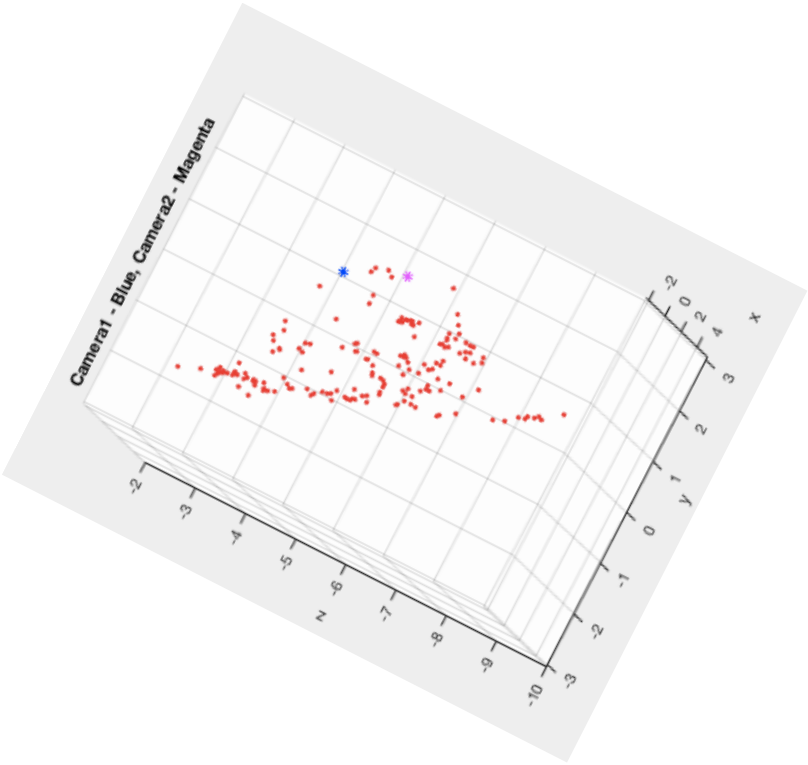
b.
House:
Number of inliers is: 60
Average Residual of Inliers is: 5.4253
Mean residual is: 15.367

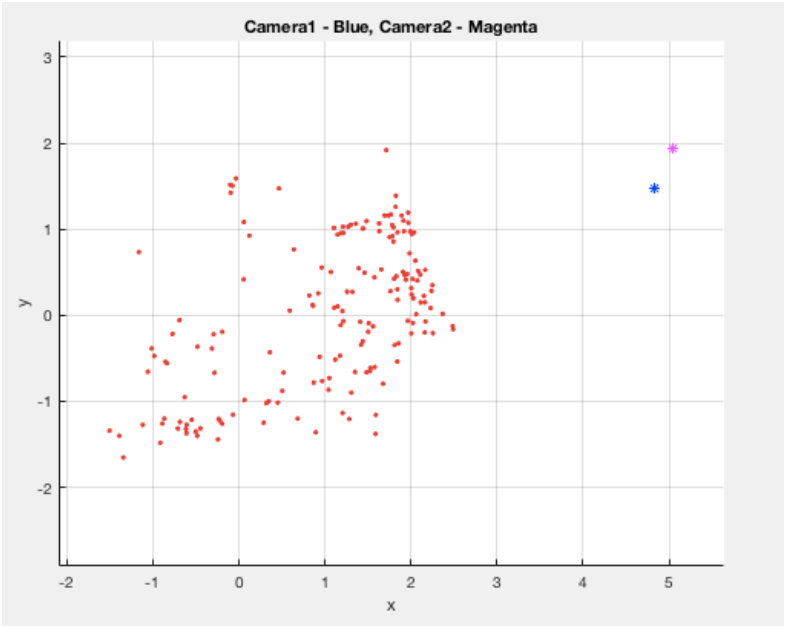


Library:
Number of inliers is: 171
Mean Residual of Inliers is: 4.3504
Mean residual is: 10.9644



c.
House:
Residual between the observed 2D points and the projected 3D points in first image: 0.0025221
Residual between the observed 2D points and the projected 3D points in second image: 0.15655





Library:
Residual between the observed 2D points and the projected 3D points in first image: 0.073128
Residual between the observed 2D points and the projected 3D points in second image: 0.26768