Nicu Ştiurcă
EID:ns7429
login:nstiurca

Problem Set 3 Programming

1.

Image 1: UT tower 2

Image 2: UT tower 1

Image 3: UT tower mosaic

2a. Some pictures I took when I went snowboarding last winter of a ski lounge. High res originals and mosaics included in my submission in the images folder.

Image 5: Ski lodge 1


Image 6: Ski lodge 2


Image 4: Ski lodge mosaic

2b. These are some pictures I took of Shanghai at night from the top of the Pearl TV Tower. There are some stitching artifacts because I moved around inside the tower, so our requirement of a camera that only rotates wasn't strictly true. This is still a good result because the scenery is far away. High res originals and mosaic are available in the images folder.

Image 7: Shanghai 2
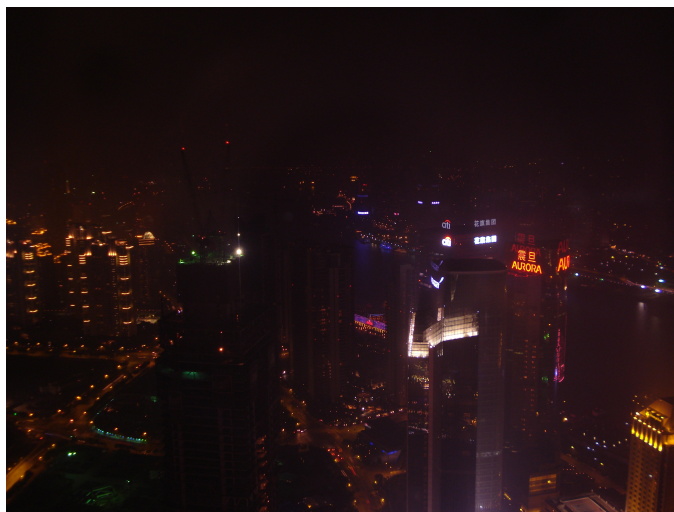
Image 9: Shanghai 1
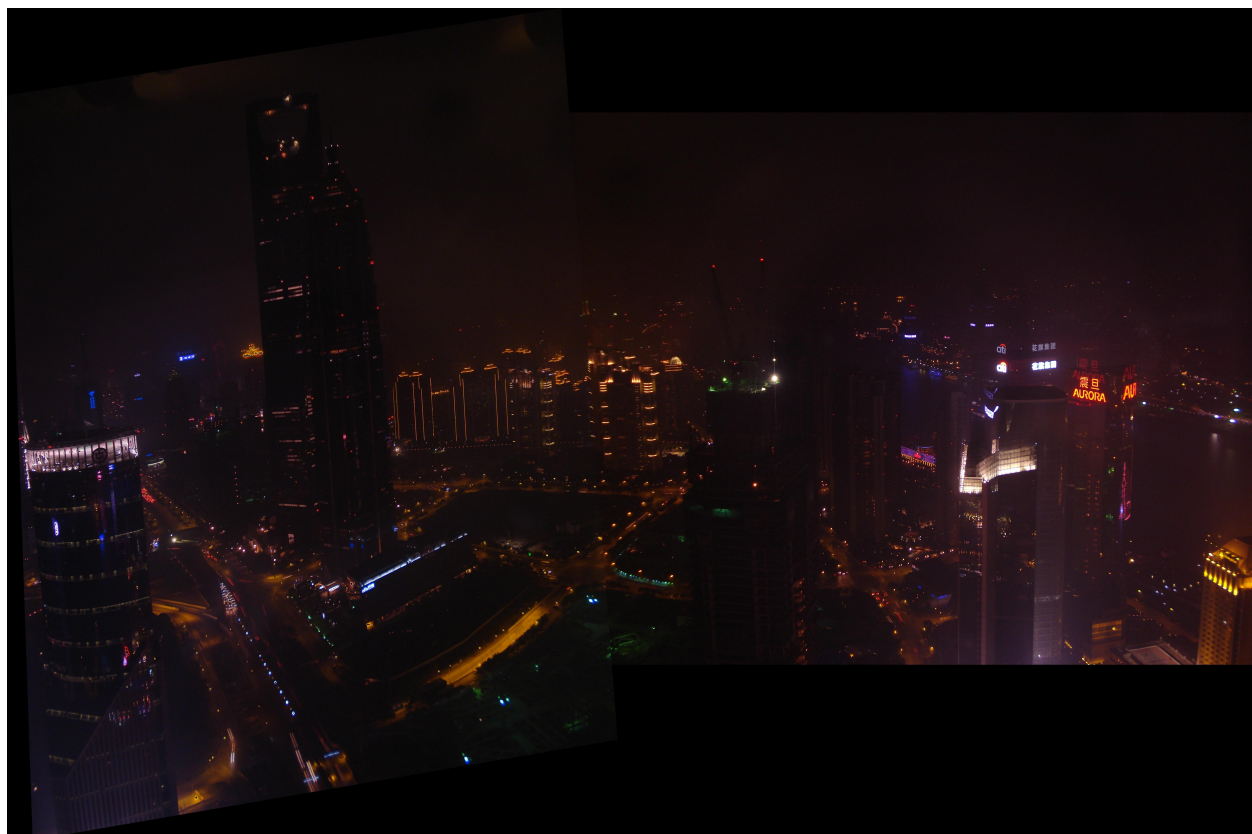
Image 8: Shanghai mosaic

3. I took a picture of the Pangu Hotel in Beijing, and I warped a phoenix into each of the 2 frames on the two visible sides of the hotel. I did this by warping the phoenix onto the hotel a first time, and then again on the output of the first iteration. Note that the second time, I entered a correspondence between the *left* side of the phoenix and the *right* side of the frame and vice versa in order to cause the warp to flip the image horizontally. High resolution originals and results available in the images folder.

Image 10: Pangu Hotel in Beijing, China
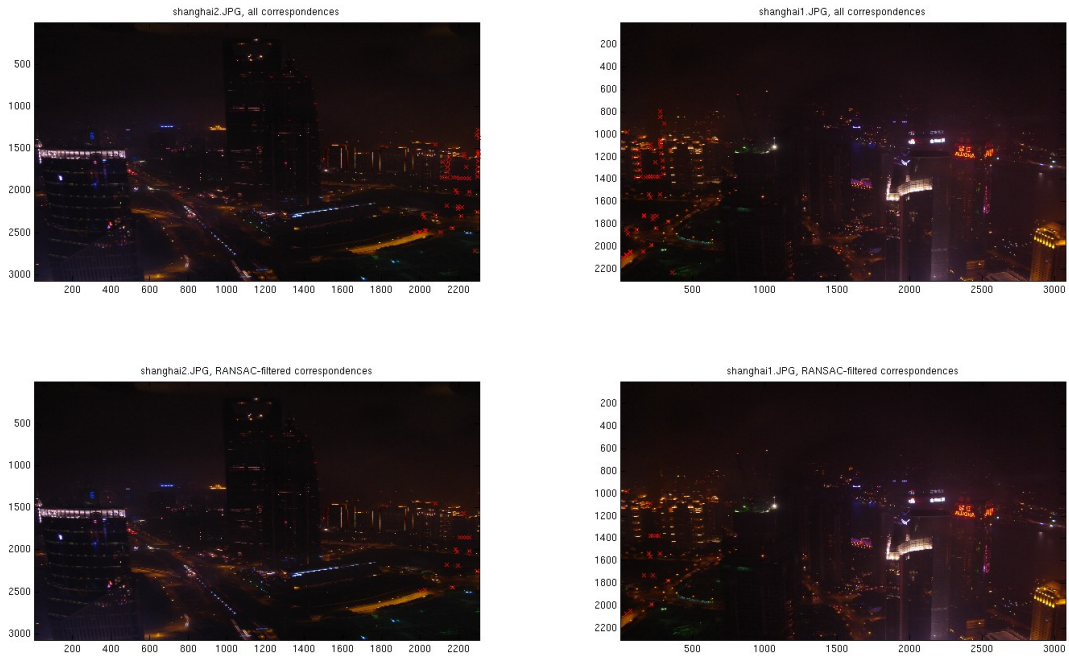

Image 13: Phoenix

Image 11: Pangu Hotel with phoenix

Image 12: Pangu Hotel with 2 phoenixes

Extra credit:
1. I recreated the Shanghai mosaic using RANSAC to get a better estimate for the homography, thus yielding fewer artifacts. High res available in images folder.


Illustration 14: Point correspondences before and after running RANSAC

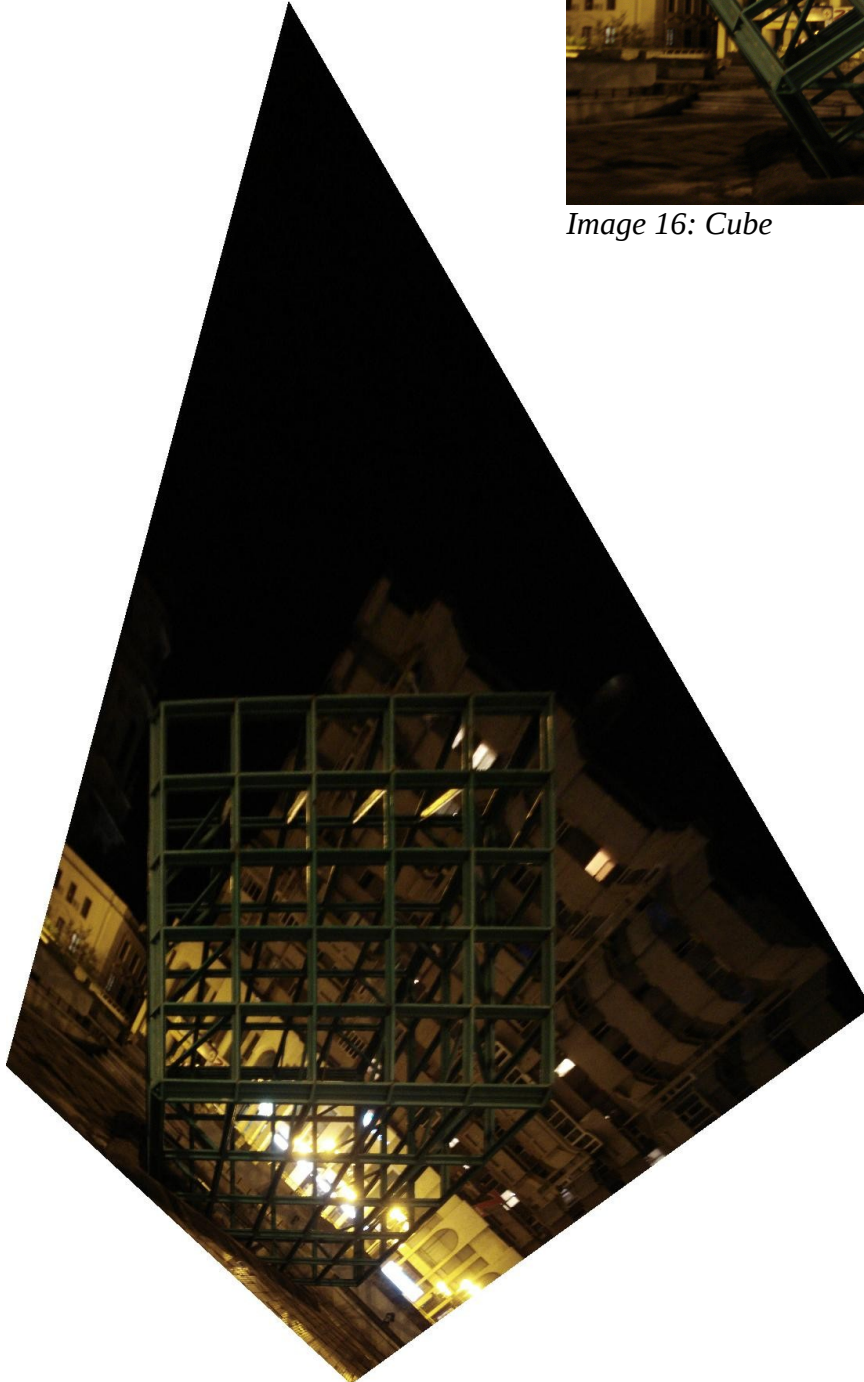*Image 15: Shanghai with RANSAC filtering of correspondence points*

2. I implemented a function to refine the user's point correspondences. You can see in the figure below how it refined the original points (in red) to new points(in green) to better match (using the same points from previous page). Some of the points are actually worse due to lighting changes or the fact that a lot of areas in these images look the same, but those can be filtered out by running RANSAC on the refined point correspondences.

shanghai1 with raw point correspondences in red, and refined points in green
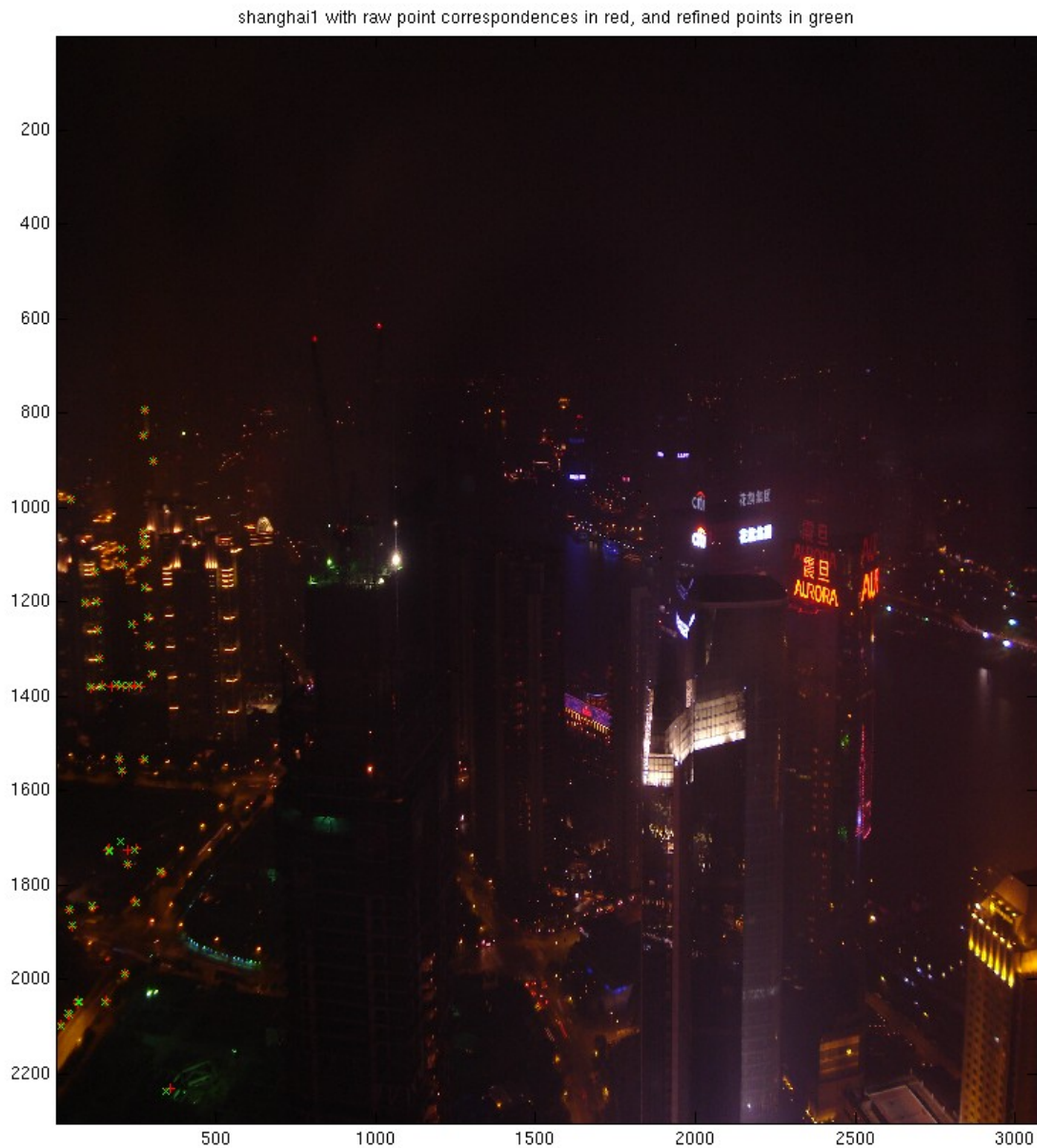
3. I took Image 6 and rectified it with the plane of the cube's surface that is most visible from the camera's perspective. High res original and rectified version available in images folder.

Image 16: Cube

Image 17: Rectified cube