CE 503 HOMEWORK 5

Assigned 1 Friday, 1 November, Due Wednesday 20 November

1. Look at the postcard image in “postcrd1a.tif” and stereo digitize some control points (building roof corners, etc.) from the purdue model being used in the map compilation project.
2. Put those control points into “control.dat” in the format: point number, East, North, Height (ascii text).
3. Observe the corresponding points on the postcard image (in adobe photoshop for example) and record in “obs.dat” in the format: point number, column, row (or equivalently point number, photoshop-x, photoshop-y).
4. Use these two files as input to “dlt.m” to obtain approximations for omega, phi, kappa, XL,YL,ZL, focal length, etc.
5. Now use “resect.m” to perform space resection (nonlinear, iterative model) to refine the exterior orientation with a sensor model approach.
6. Initial approximations go into “cam.inp” in the format: omega (radians), phi, kappa, XL,YL,ZL,x0,y0,f (ascii text)
7. Assuming that you get a converged and reasonable solution, then do a “manual” version of self-calibration by systematically varying the interior orientation parameters f, x0, y0 to get the best solution (smallest residuals).
8. Document all steps, draw some conclusions, and write a small report on the this effort.