# CE 597 (029) Adj. of Geospatial Obs. HW6

## Assigned Wed. 18 Nov., Due Mon. 30 Nov.

- Go to http://www.ngs.noaa.gov/CORS/ for info and data related to the Continuously Operating Reference Stations operated by and in conjunction with NGS.

- Retrieve compressed RINEX GPS data for stations PRDU (operated respectively by Purdue University) for 1 November 2009 for epochs 0:0:0.00, 0:15:0.00; 0:30:0.00, 0:45:0.00 (h:m:s). Filename should be something like prdu3050.09o. In this file find the specified epochs and find the field C1 (pseudorange on C/A code). Units are meters for the pseudoranges. Also find approximate geocentric ECEF coordinates of the station.

- Retrieve satellite data for the same day from a CORS ftp site. Filename should be something like igu15560_00.sp3.  we need data for the same epochs as above for each of the satellites for which there is an observation. Fields needed are X,Y,Z,dt. Units are km, in ECEF, dt units are micro-seconds. PR(corr)=PR(raw) + c*dt. Use c = 299792458 m/s. micro-seconds are 1*10e-06 sec.

- Recommend units in the LS problems: km & usec,  assume pseudorange sigma is 25 meters, make 2-sided global  test at alpha=.05. Make 90% conf. ellipse in local cartesian system (ENU) for uE and uN, and 90% conf. interval for U.

- Solve the following LS problems using pseudorange observations:
  - Solve for prdu location using only the first epoch (one clock unknown)
  - Solve for prdu location using all 4 epochs (four clock unknowns)
- In both cases try given XYZ and (0,0,0) as initial approximations
- Remember that you need a new parameter DT for each receiver for each epoch
- Use the following condition equation:

$$F = PR_{corr} - \left[ (x - x_s)^2 + (y - y_s)^2 + (z - z_s)^2 \right]^{1/2} - c(DT) = 0$$