

Is Camera pose inference using structure from motion as good as GPS?

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Position Data 6-30-2015

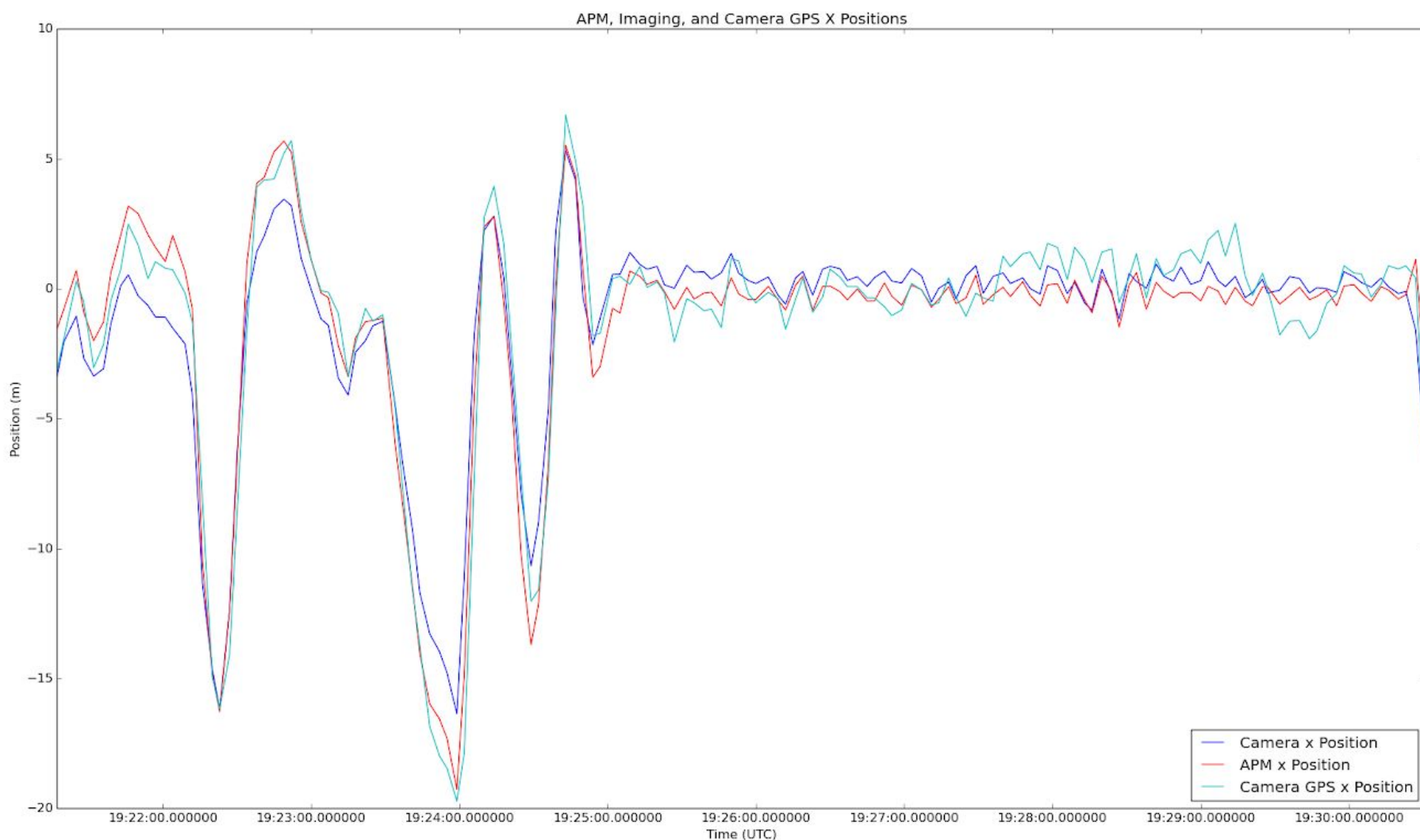
Two programs were completed to extract and analyze data from the APM GPS, camera imaging, and camera GPS X, Y, and Z positions, titled “exifreadtest.py” and “apm_camera_position.py”. Both scripts can be found in the ECHO Dropbox.

exifreadtest.py extracts data from the internal GPS of the Canon S100 Powershot. The resulting .txt file returns, in order, the image name, date/time in ISOT format, latitude, longitude, and altitudes in meters from sea level. Images must be put into their own file and iterated through. The resulting data is then usable for the second program.

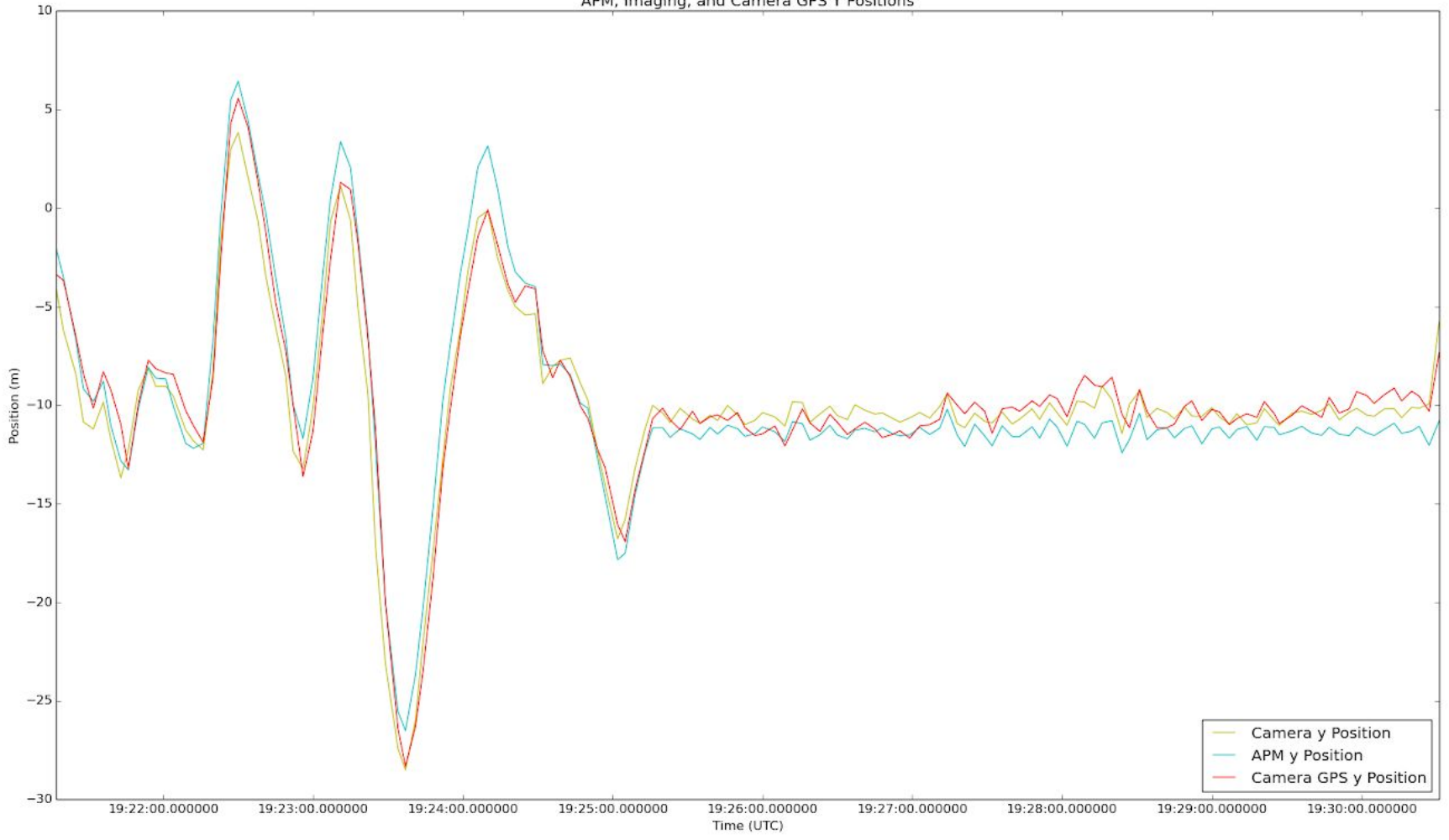
Command Terminal: temp@loco:~/Dropbox/ECHO/test/pictures\$ python ../../exifreadtest.py IMG*.JPG

apm_camera_position.py is a plotting script for the camera GPS data, camera photo position data, and APM GPS data. The APM data is interpolated to the camera data and both sets of camera data are “calibrated” to the APM data to get rid of offset.

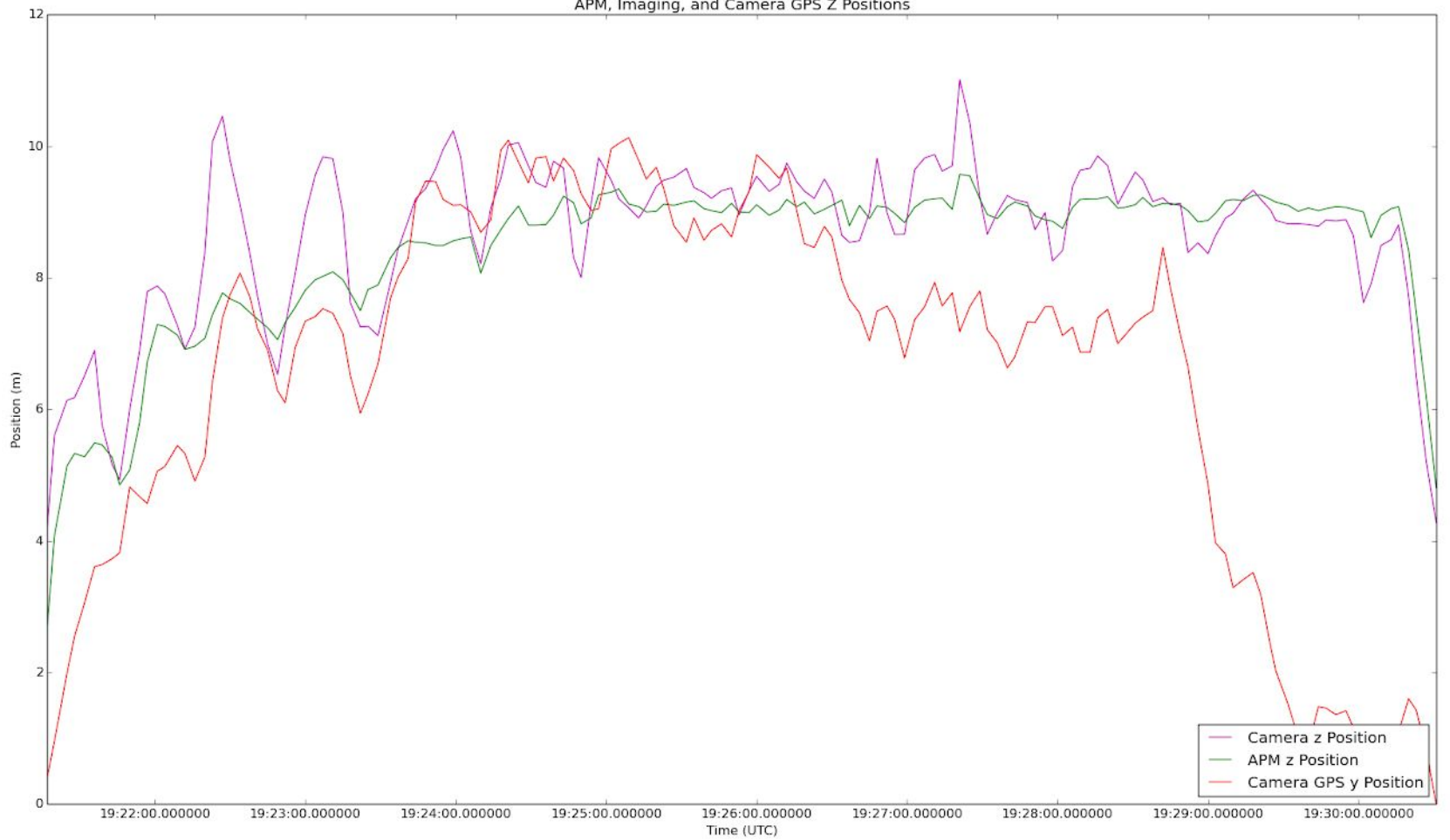
Command Terminal: temp@loco:~/Dropbox/ECHO/test\$ python ../apm_camera_position.py camdata.txt
ECHO_6June2015_flight2_XYZ.txt 1.log



APM, Imaging, and Camera GPS Y Positions



APM, Imaging, and Camera GPS Z Positions



The graphs created show that there is a general correlation (at least in the x and y positions) between all the position data. There are some notable inconsistencies with the camera GPS positions, but this may be because the camera's GPS satellite count could be lower than that in the APM. The least amount of accuracy is in the Z position, which may be caused by the lack of reliable base position data. Given that the camera's GPS and the imaging data was based off meters from sea level, to get the relative altitude, the measurement when the camera is on the ground must be taken to get accurate readings. This wasn't done formally, so the values are approximate in this graph.