GPS Post Processing System

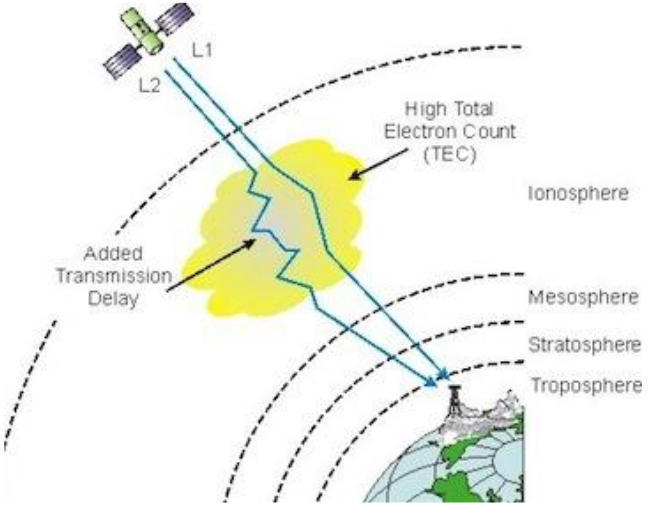
Dominic Fuller-Rowell, Michael Brandt, Waverly Hinton

General Principle

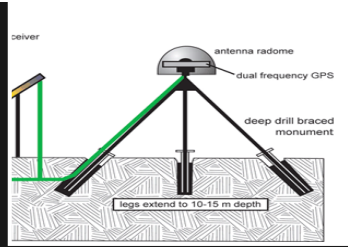
We set out to create a program that would apply trilateration corrections to a set of GPS data to provide a more accurate report of a person’s location.

Differential GPS

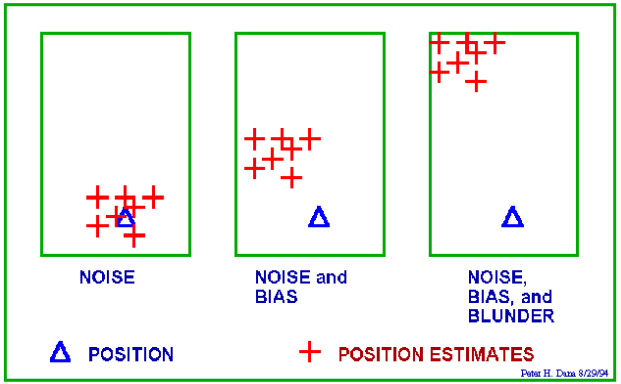
- Handheld GPS receivers suffer from a number of sources of error.
- Two GPS receivers in the same geographical area suffer from the **same sources of error**.
- The **difference** between the **calculated** and **true** positions of two receivers is the same!
- Δposition1(X,Y,Z) == Δposition2(X,Y,Z)



Array of Base Stations



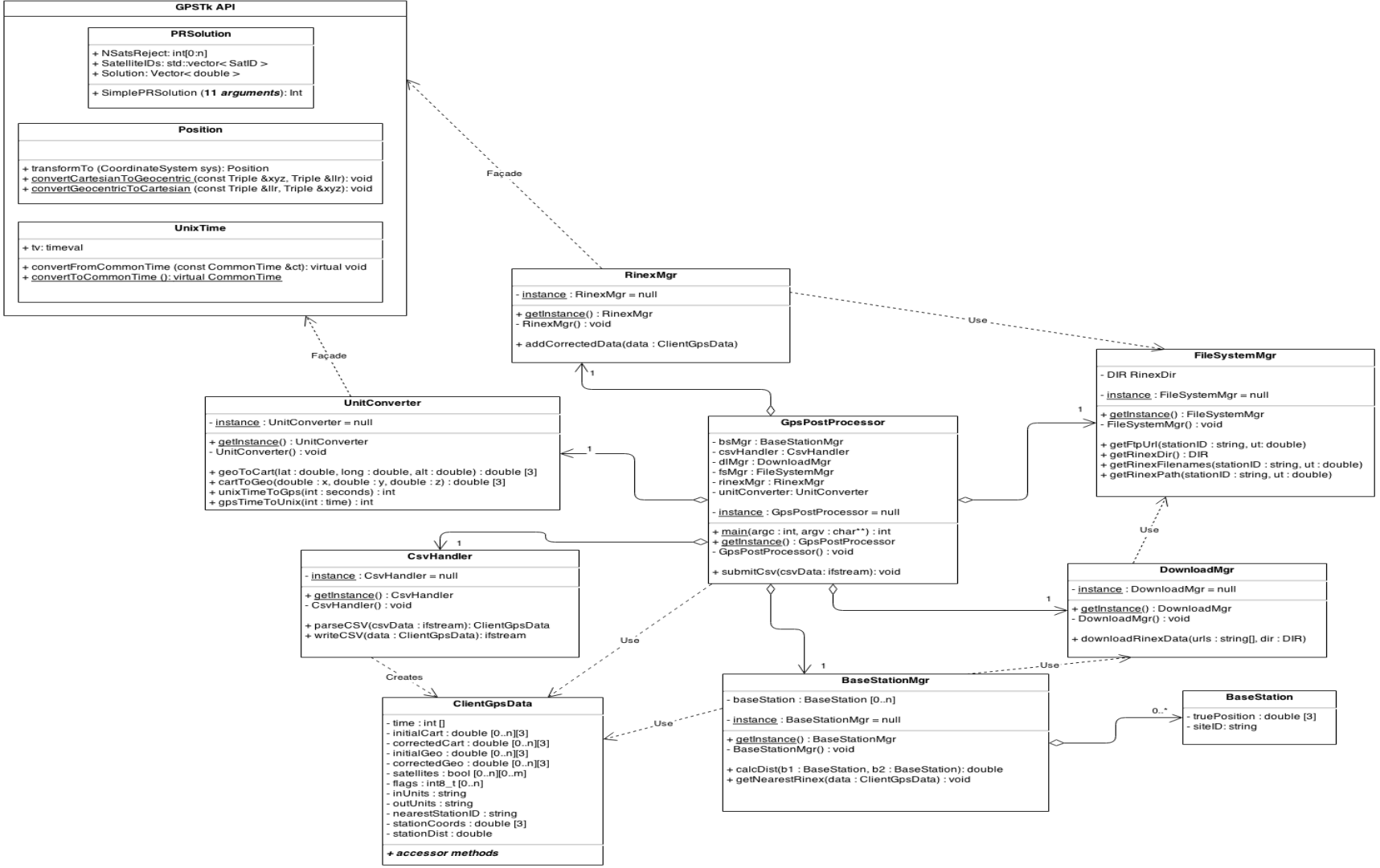
- CORS/NGS provide RINEX GPS data for a vast array of dual frequency commercial receivers.
- GPS Toolkit (C++) provides the means to utilize the RINEX data.
- Our code interfaces GPS Toolkit with CORS to provide more accurate post-processed geographical data.



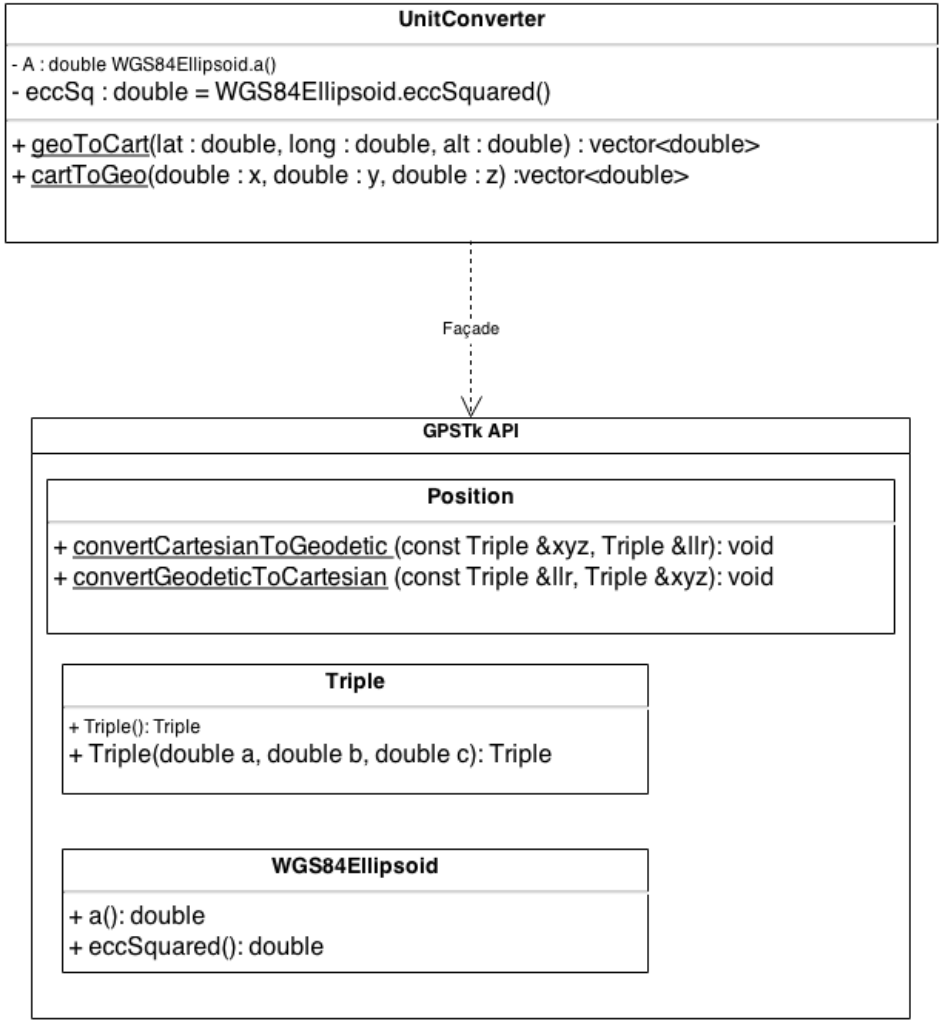
Design Patterns used

- Singleton - GpsPostProcessor.cpp
- Façade - UnitConverter.cpp and RinexMgr.cpp both act as Façades to the GPSTk API

Class Diagram



Class Diagram



Demo

OMG it’s a demo

Lessons Learned

- git commit often
- C++ experience
- time spent planning helps guide coding
  - 1 minute spent planning saves 2 minutes coding

Going Forward

- integrate Rails app with C++ code
- make real time corrector
- flesh out the Android app