What is the goal of the GNSS Competence Team?

Our goal is to achieve broad-wide GNSS competence. The team will study every major aspect of the GNSS, one by one. Every competence mile stone has the following parts.

First step is to study the basic literature and collect all the relevant studies or book chapters about that topic.

Second step. The team sits together and discusses the collected literature. We shall define a specific programming task to achieve a deep knowledge. If you can code it, you know it.

We shall write a specification about it.

Third step. The team writes down the pseudo-code. The pseudo-code has to reflect the algorithm what we wish to implement. It shall be clear. One who see the pseudo-code has to be able track back to the real algorithm.

What do we have to learn?

I will give you some example about the possible mile stones.

1. Implement a pseudo range based navigation algorithm with iterative least square method.

2. Upgrade the previous task with Kalman filter. We shall create a Kalman filter and observe its behavior.

3. Implement a differential GNSS solution in a static scenario. Select two relatively close Rinex measurement station from IGS web page (<http://www.igs.org/rts>). One is the base station other is the rover.

4. Differential GNSS in kinematic scenario. Gaining the right data could be challenging. One possible solution is to use one of the kinematic vmps measurement with Rinex input data as a rover and select a close static station from the IGS web page. It will be the base station.

5. Ambiguity resolution. Float solution.

6. Ambiguity resolution. Integer fixing.

7. Satellite position/velocity calculation from ephemeris in case of GPS, Galileo, GLONASS.

8. Fit an ephemeris set to a given satellite trajectory in case of GPS, Galileo and GLONASS.

9. Implement a basic RAIM algorithm.

10. Investigate to a more advanced RAIM algorithms.

11. Investigate a possible integrity algorithms

12. Learn the usage of the u-blox development board. How to log data. How to convert it to a more flexible format. Calculate a solution from the logged data.

13. u-blox dev boards. One is the base station, another is the rover. Log the data, and calculate a DGNSS solution offline.

14. Ambiguity filtering with the help of the u-blox dev boards.