

Theme: GNSS

# GPS for advanced vehicle applications

### Summary

GPS is commonly known because of its widespread use in car navigation systems. However, GPS has more useful properties like time synchronisation and accurate velocity measurements. When two antennas are used, one speaks about dual-GPS. Such systems are able to estimate the vehicle's orientation and slip within  $1^\circ$ . This information is complementary to existing sensors in the vehicle and can be used to estimate the vehicle's dynamic state and parameters.

Dual GPS receivers are typically high-end systems and therefore expensive. When factors like delay and update rates are relaxed, these systems could be realized with cost-effective components. As such they could become a very important vehicle sensor.

You will investigate the system workings of modern GPS receivers in order to estimate the potential for application in vehicles.

### Objectives

The aim is to show: 1) whether such a vehicle sensor is possible in practice and 2) what could be realized in terms of (relative) position assessment when GPS information is exchanged between communicating vehicles. You will realize a prototype (based on off-the-shelf hardware) that will be installed on a vehicle. Actual measurements will be taken on the open road or a closed test track to compare its performance against high-end reference systems.

### Profile

The candidate will work with the TNO Integrated Vehicle Safety department in Helmond, for a period of 6-9 months. The candidate is expected to have experience with software development, preferably with Matlab and embedded software. Affinity with automotive and a car driver license is a pré.

### Client

The TNO Integrated Vehicle Safety department in Helmond focuses on innovative solutions to improve the safety of vehicles. Within the department, state-of-the-art vehicle technology is developed. Currently the usage of GPS gains more attention due to its low-cost and its potential for delivering new sensor measurements.



### Obligatory committee members:

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