Vehicle for experimental research on trajectories

IFSTTAR

VERT

The vehicle for experimental research on trajectories

The Vehicle for Experimental Research on Trajectories (VERT) is an instrumented vehicle dedicated to intelligent transportation systems (ITS). Thus, it allows the acquisition and replay of GNSS signals, inertial data, digital signals, video frames, etc ... for the purposes of scientific research, expertise and demonstration in geolocalization domain. It is equipped with a Reference Trajectory Measurement System (RTMeS) for measuring the error of the devices under test and qualifying innovative algorithms developed by GEOLOC. Accuracy of the produced reference trajectories is better than one decimeter even in difficult conditions such as city centers or tunnels.

MRT makes use of the LandINS inertial navigation system, built by the French company IXSEA, which offers a real-time / time-delayed hybridisation:

- of an inertial unit (containing 3 accelerometers and 3 optical fibre gyroscopes)
- with an odomètre
- and with a GPS receiver

Performances

Thanks to the high quality sensors embedded, this inertial unit coupled with the phase differential GPS is capable of producing trajectories at 100 Hz with RMS precision:

- in heading-roll-pitch angles of 0.01°
- in horizontal position of 3.5 cm
- in vertical position of 5 cm

when the differential GPS is available.

RMS drift for 2 minutes while the differential GPS is no longer available:

- Angular < 0.01°
- Horizontal < 30 cm in real time and 15 cm in post processing mode
- Vertical < 20 cm in real time and 10 cm in post processing mode

MRT related missions

Positioning system qualification

MRT has been recently implemented in an expertise for Thales Alenia Space aimed at quantifying GPS and GPS/EGNOS positioning errors within an urban environment.

Development of a real-time vehicle guidance system

MRT has also been used in several ITS (Intelligent Transport Systems) projects and was assigned a major role in the new “CityVIP” project as part of the PREDIT programme.

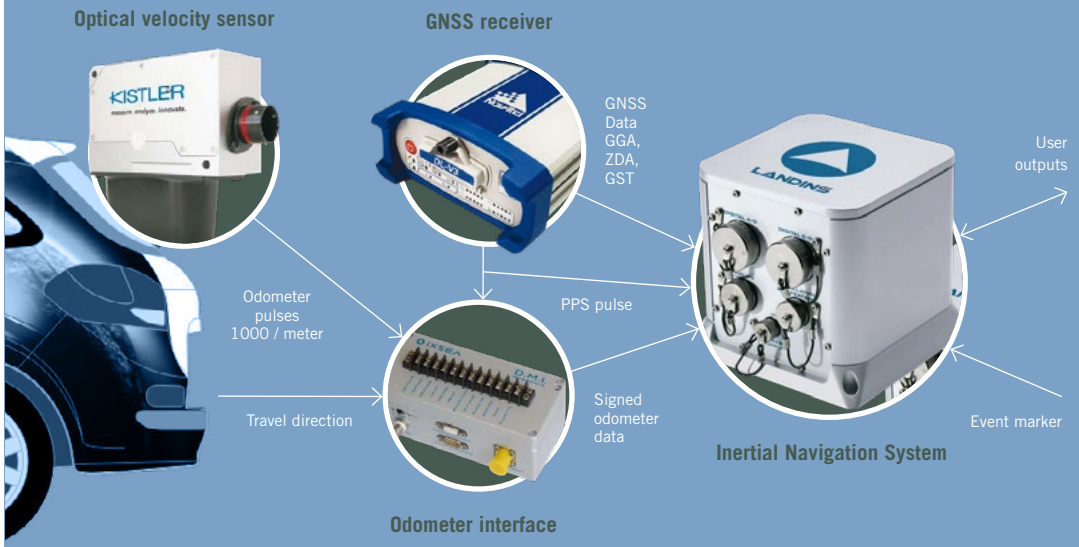
Validation of trajectory observations from either onboard or roadside devices

MRT allows validating the effectiveness of observation devices in providing the reference trajectory of the instrumented vehicle.

Support for IFSTTAR’s research

- Thesis conducted on the modelling and detection of hazardous trajectories.
- Research project devoted to vehicle controllability.

MRT Composition



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