Profound-DR

Continuous Accurate Navigation

Profound Positioning Inc. Profound-DR is a cutting-edge sensor fusion navigation library for land vehicle and mobile robot 3D navigation applications in degraded or denied GNSS signals environments such as tunnels, indoor parking, urban centers, and multi-level highway junctions.

Sustained Accuracy Wherever You Drive

Backed by Profound Fusion+ technology, the Profound-DR maintains high positioning using integrated low-cost inertial sensor measurements combined with speed measurements from the vehicle's speedometer.

Initializes and Starts from Anywhere

Profound-DR initializes automatically within a few minutes in open sky with no need for specific vehicle dynamics. Positioning information is available immediately **inside covered or underground parking garages.**

Advanced Inertial Navigation Algorithms

Profound-DR features a special inertial sensor navigation and advanced dynamic error models that minimize sensor errors and prevent them from propagating through the navigation algorithm, resulting in more reliable 3D navigation performance.

Smartly Fuse GNSS, Inertial Sensor Measurements, and Vehicle's Speed

Profound-DR combines GNSS updates with inertial sensor measurements and vehicle's speed resulting in continuous, accurate and reliable positioning in all environments.

Unique Integration Filter Extending Standalone Operation

Profound-DR utilizes its unique multi-sensor fusion filter with online sensor error calibration to extend the operation of the system where many standard filters would fail.

Customizable

Profound-DR can be customized to target any grade of IMU and GNSS receivers. Profound-DR has been optimized to run in real-time for a variety of mainstream processors, including ARM Cortex-M4F based processors, to provide the most accurate, reliable, and low-cost 3D navigation.

Profound-DR Positioning Available

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GNSS Signal Unavailable

GNSS Signal Available

Profound-DR — High-Rate Accurate Positioning Solution

Profound-DR Will Navigate You Without GNSS

Profound-DR Will Help GNSS Fast Signal Re-Acquisition

Profound-DR
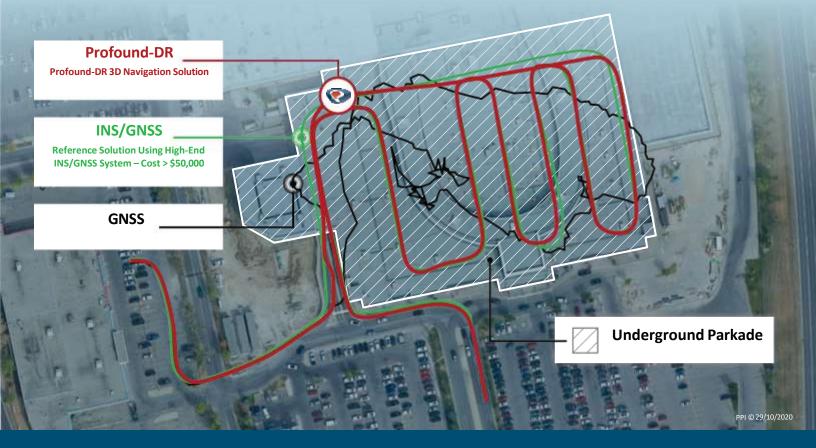
Continuous Accurate Navigation

Key Features

- Single library that can work automatically in two modes:

  - Tethered DR (TDR): Integrated GNSS, speed measurements from vehicle speedometer with either 6 DoF or 10 DoF sensors.

  - Untethered DR (UDR): Integrated GNSS with either 6 DoF or 10 DoF sensors.

- Plug-and-play capability with no need to any special vehicle dynamics during system initialization.

- Continuous and robust 3D navigation in urban and denied GNSS areas using consumer-grade MEMS inertial sensors.

- Real-time sustained performance at high data rate.

- Ability to start in denied GNSS environment such as underground parking where no GNSS updates are available.

- Open to work with GNSS receivers that support multi-constellations (GPS, GLONASS, Galileo and BeiDou).

- Flexible GNSS mode: can work with SPP, PPP, RTK or with Profound's PPP engine IP3.

- Can integrate with other sources of update such as HD maps, vision, LiDAR, and radar.

- Fast re-acquisition of GNSS satellite signals at the end of long GNSS outages.

Targeted Applications

Profound-DR provides continuous and accurate 3D navigation for:

- In-dash car navigation.

- Wheel-based unmanned ground vehicles.

- Safety critical platforms such as self-driving cars.

Profound-DR
Profound-DR 3D Navigation Solution

INS/GNSS
Reference Solution Using High-End INS/GNSS System – Cost > $50,000

GNSS

Underground Parkade

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