



HYLOC

A FLEXIBLE EMBEDDED HARDWARE PLATFORM EVALUATES MULTIMODAL LOCALIZATION AND MOTION MONITORING ALGORITHMS

+ WHAT IS HYLOC?

HYLOC is a flexible embedded hardware platform designed to evaluate the latest hybrid data fusion algorithms for precise, resilient multimodal localization and motion tracking. Built around a high-end digital signal processing module and an FPGA, it integrates:

- GNSS receivers using standard and high-accuracy GPS RTK technology
- An ultra-wide band radio
- ISM-compatible, 868 MHz and 2.4 GHz communication band radios
- A consumer grade, low-cost measurement unit
- A tactical grade, high-accuracy inertial measurement unit

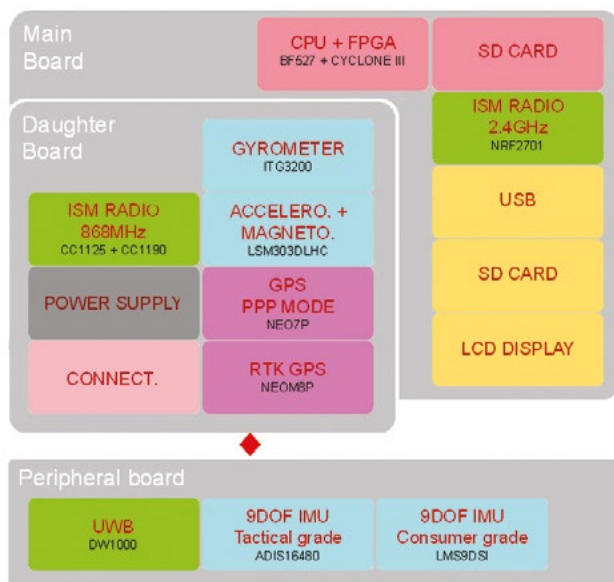
+ APPLICATIONS

Hybrid data fusion algorithms for multimodal localization are often difficult to optimize for environmental and operating conditions. Leti HYLOC accelerates optimization from algorithm development to implementation to:

- Explore unknown environments or challenging contexts, in which localization is critical, such as:
 - Autonomous vehicle technology
 - Industry of the future
 - Personal asset management
 - IoT data geo-referencing for Big Data analysis
 - Next Human-Machine Interfaces & Virtual/Augmented Reality
- Evaluate alternative fusion modalities based on flexible mother/daughter board architecture

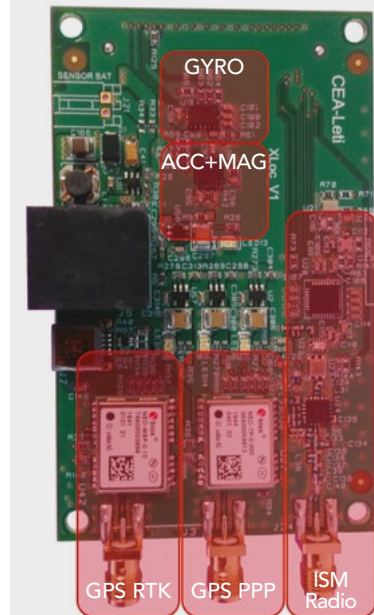
+ WHAT'S NEW?

- Localization scenarios can be recorded in log files for consumer metrics and high-end components. Fusion algorithms can then be fine-tuned offline
- Communication protocol impact on and from localization fusion algorithms can be assessed
- Fusion algorithms can be embedded in real-time CPU for early prototyping
- HYLOC can be used as a baseline for more integrated RTLS or stand-alone solutions
- Simultaneous GNSS (GPS and GPS RTK), radio (ISN and UWB) and inertial (tactical and consumer IMU) access to consumer and high-end localization sensors can provide exhaustive benchmarks
- Small form factor of complete solution foreshadows future systems and facilitates field trials
- Flexibility in adding new localization or communication modalities and technology contexts, while managing gradually increasing system complexity



EXPERIENCE IN THE FIELD:

- **Radio-based localization** (4 PhDs, 58 conference papers, 4 journal articles, 15 patents)
- **Fusion-based hybrid localization** (3 PhDs, 13 conference papers, 2 journal articles, 4 patents)
- **Sensor-based localization** (5 PhDs, 6 conference papers, 2 journal articles, 25 patents)



+ WHAT'S NEXT?

HYLOC updates can be considered to support new technologies such as:

- Emerging radio accesses: 5G, IEEE 802.11p, LPWA
- New GNSS solutions, e.g. Galileo
- Alternative high-end or consumer IMU components

INTERESTED IN THIS TECHNOLOGY?

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