

SUCCESS STORY

SLAM-based Mobile Mapping System

Motion Compensation & SLAM Algorithms aiding

VIAMETRIS has selected the Ellipse-D inertial navigation system to equip the vMS3D, a Mobile Mapping System which uses the best of inertial, GNSS, and SLAM technologies.



CLIENT

VIAMETRIS

APPLICATION

SLAM-based
Mobile Mapping System

PRODUCT

Ellipse-D Inertial Navigation
System with embedded RTK GNSS
receiver

PROJECT

Motion Compensation & SLAM
Algorithms aiding

VIAMETRIS is a precursor in the development of SLAM-based solutions. Two years ago, the company released the iMS3D, an indoor mapping system based on the SLAM technology. Capitalizing on this experience, the company has just launched a new solution: the vMS3D, a mobile mapping system combining the best of inertial, GNSS, and SLAM technologies to offer an innovative solution with attractive performance/price ratio.

THE VMS3D, THE SMARTEST MOBILE MAPPING SYSTEM

vMS3D looks like a classic Mobile Mapping System (MMS). It integrates a 360° camera, a rotating LiDAR, an internal navigation system with GNSS

receiver. The straightforward automatic workflow does not show the subtle and yet sophisticated internal computation that makes it unique. Indeed, the vMS3D is equipped with an additional LiDAR used for SLAM computation. After the acquisition, the post-processing software -named PPIIMS- automatically analyses the situations where GNSS is sufficient, where inertial is preferred, or where SLAM is required.

THE BEST OF 3 WORLDS: GNSS, INERTIAL, AND SLAM

The vMS3D solution takes into account the advantages and disadvantages of each technology, depending on their conditions of use. When the GNSS receiver provides reliable data, for

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Jérôme Ninot, the Founder of VIAMETRIS

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vMS3D, the Mobile Mapping System from VIAMETRIS

instance in open sky environment, the solution simply relies on its position. If a GNSS outage or disturbance occurs, the system then chooses between inertial or SLAM-based data.

Position computed from SLAM is preferred in dense environments where surrounding objects are very diverse and close, such as in urban canyons or forests. SLAM capabilities are limited in environments where objects are too far or not distinguishable. Velocities and orientation information provided by the Inertial Navigation System (INS) are then able to assist the navigation in all the cases where GNSS and SLAM are limited. Performance can also be improved with the use of odometer, and ground control points.

ELLIPSE-D, THE SMART CHOICE OF VIAMETRIS

Already very satisfied with the Ellipse for his indoor iMS3D, Jérôme Ninot, the Founder of VIAMETRIS, did not look so far to select an INS for his new innovative project. "Ellipse INS provides very, very precise velocity data", states Mr. Ninot. The innovative SLAM computation allows VIAMETRIS to rely on miniature and cost-effective inertial sensors while other systems on the market require higher accuracy inertial systems. Ellipse sensors deliver 0.1° accurate attitude. Mr. Ninot also chose the Ellipse-D model for the all-in-one and miniature form factor, and the embedded RTK GNSS receiver. "With an integrated INS like the Ellipse-D, offering a single communication interface and

built-in synchronisation to the GNSS and LiDAR, we have been able to concentrate on our SLAM expertise" adds the CEO, before mentioning that less cable is always a good choice.

ELLIPSE-D, A PARTNER FOR MANY TASKS

Integrated into this innovative solution, the Ellipse-D performs several tasks. First, it provides roll and pitch to constraint all LiDAR data, so the point cloud is referenced at ground level. Secondly, Ellipse-D turn rates are very helpful, especially when an abrupt change of direction occurs. Indeed, orientation compensation is required between two scans when the LiDAR is in motion. Finally, Ellipse-D fuses in real time inertial and GNSS information to provide excellent velocity measurements which are also very important to continuously assist vMS3D internal algorithms.

■ Hélène LEPLOMB
SBG Systems

"Ellipse INS provides very, very precise velocity data"

Jérôme Ninot, the Founder of VIAMETRIS

ELLIPSE-D KEY FEATURES

- » 0.1° Roll & Pitch, up to 0.2° GNSS Heading using two antennas
- » Internal Survey-grade GNSS receiver with RTK and Post-processing capabilities
- » Compact and cost-effective solution



ABOUT VIAMETRIS

Founded in 2007, VIAMETRIS research and development team is specialized in image and signal processing, artificial intelligence, and robotics. After developing an expertise in the construction market with a mobile 3D scanner, VIAMETRIS is now focused on designing 2D and 3D mobile mapping systems combining precision and ease-of-use while reducing execution time.

MORE INFO: <http://www.viametris.com>