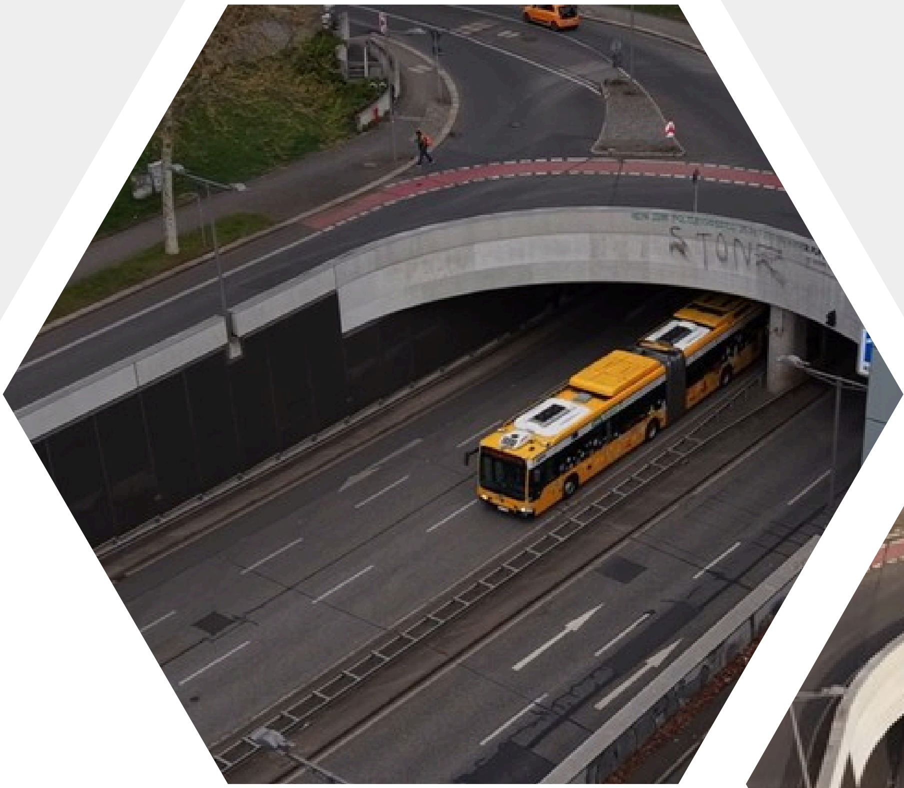

DREAM

DRIVING AIDS POWERED BY E-GNSS AI AND MACHINE LEARNING

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1. Introduction – Entering the Final Phase

As the DREAM project reaches its final stage, the focus has shifted from development to full system validation and demonstration. Over the course of the project, the consortium has integrated its key technologies, combining advanced localization and environment perception capabilities into a unified system.

Following the completion of development and subsystem-level verification, the project has progressed to the validation of the complete solution in representative operational conditions.

2. Final Development and Validation Activities

During the final months of the project, significant effort has been devoted to consolidating and validating the integrated system. This has included the refinement of algorithms, optimization of sensor fusion strategies, and alignment of system outputs with user-defined requirements.

A key part of this work has been the execution of end-to-end validation activities, moving beyond individual component testing to assess the full system performance. These activities confirm that localization and perception modules operate seamlessly together, delivering consistent and reliable outputs under a wide range of conditions.

In parallel, the consortium has prepared and carried out a system demonstration campaign, designed to assess the behaviour of the complete solution in real-world environments.

3. Demonstration Campaign

The demonstration campaign represents the culmination of the DREAM project, showcasing the performance of the integrated system in real operational conditions. The system was deployed onboard a bus and evaluated in a complex urban environment, enabling assessment under realistic driving scenarios.

The results demonstrate the ability to provide a continuous and stable localization solution, even in challenging conditions where GNSS signals are degraded or unavailable, while simultaneously delivering a reliable understanding of the surrounding environment. In particular, the system maintains accurate positioning during GNSS-denied segments, such as tunnels, and consistently detects and tracks road users.

Beyond core system performance, the campaign also enabled the validation of driving assistance functionalities supported by the integrated localization and perception capabilities. The following four ADAS functionalities were evaluated:

- Wrong Way Driving (WWD): Detection and alert when the vehicle is travelling in the wrong direction on a one-way road or against the designated flow of traffic.
- Red Light Warning (RLW): Real-time detection of red traffic signals ahead of the vehicle and generation of corresponding driver alerts.
- Obstacle in the Route Warning: Detection of static or dynamic obstacles within the planned vehicle trajectory, with timely warning generation for the driver.
- Curve Speed Warning (CSW): Assessment of vehicle speed relative to upcoming curve geometry, with advisory alerts when speed exceeds safe thresholds.

Overall, the campaign confirms the capability of the system to operate as a coherent solution in real time, supporting driving assistance and related applications. Key results are illustrated through videos and figures highlighting representative scenarios and system behaviour.

4. From Project Results to Operational Solutions

The DREAM project has not only demonstrated advanced capabilities, but has also significantly strengthened and extended ANavS existing solutions.

On the localization side, the project has enabled further advancements in GNSS-based positioning, including extended use of Galileo services such as High Accuracy Service (HAS) and OSNMA. In particular, the PPP algorithms have been refined and validated under challenging conditions, while the integration of OSNMA contributes to increasing the trustworthiness of the solution. In parallel, AI-based spoofing detection techniques have been developed and are now integrated into the A-Shield product, reinforcing resilience against emerging threats.

For environment perception, existing solutions have been extended to provide richer and more consistent scene understanding. This includes the generation of 3D bounding boxes with trajectory estimation, as well as the integration of AI-based techniques for dynamic object removal, improving the overall performance of localization and mapping in complex environments.

These advancements are now part of the ANavS product portfolio, including A-ROX, AI-ROX and the recently introduced A-Shield solution. Together, they provide a robust technological foundation to support driving assistance applications in the automotive sector, as well as deployment in other operational environments requiring reliable and resilient positioning and perception capabilities.
Further details on these solutions can be found in the latest ANavS product brochures.

5. Conclusion

As the DREAM project reaches its final stage, the results demonstrate the readiness of the developed technologies for real-world deployment. Through end-to-end validation and system demonstration, the project confirms the capability of integrated localization and perception solutions to operate reliably in challenging conditions and support advanced driving assistance applications.

These developments are now part of the ANavS portfolio, contributing to more robust, accurate and trustworthy solutions for automotive and other demanding operational environments.

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