



DREAM

DRIVING AIDS
POWERED BY E-GNSS
AI AND MACHINE
LEARNING

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Overview

The DREAM project, which started on 1 December 2023 and will run for two years, is on track at the 'halfway point'. Thanks to the full commitment of all teams, we were able to reach our milestones on time.

1. User Requirements

During the reporting period, a comprehensive User Requirements Document (URD) was prepared leveraging both the company's expertise and direct feedback from customers, ensuring alignment with real-world needs and regulatory frameworks.

These requirements were carefully flowed down into a detailed set of system-level requirements, ensuring that all aspects of the system design, including algorithms, hardware, and software are covered by the project specifications.



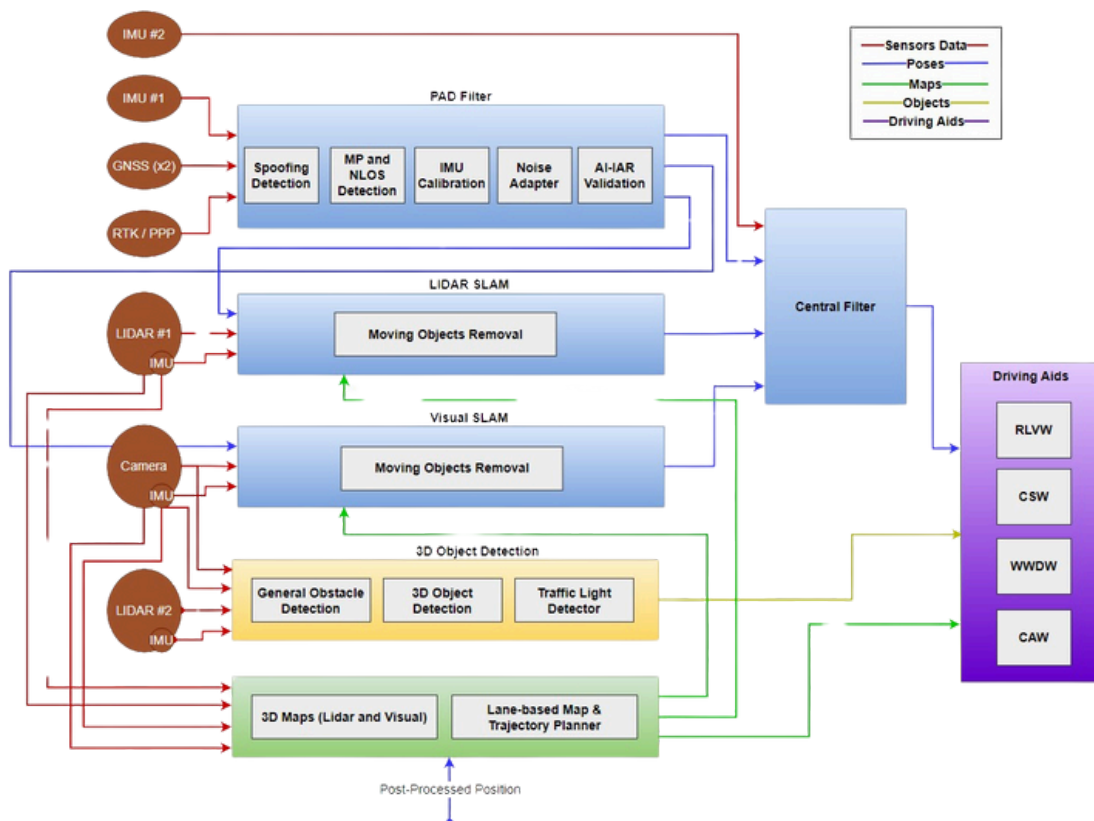


2. System Design

A very detailed design phase was completed during this period, culminating in the delivery of the Design Justification File (DJF), Architecture Description Document (ADD) and COTS Justification File (CJF).

These documents include a fine-grained description of every single algorithm, interface, and subsystem:

- The design covers the multi-pose filter, GNSS PPP algorithm, AI-based object detection, and SLAM algorithms, among others, while introducing critical features such as relocalization and computational performance optimization.
- All software and hardware interfaces were thoroughly defined, detailing protocols, message rates, formats, and other specifications necessary for seamless integration.
- Trade-offs were documented and justified for every key design decision, particularly for the selection of algorithms and COTS components.

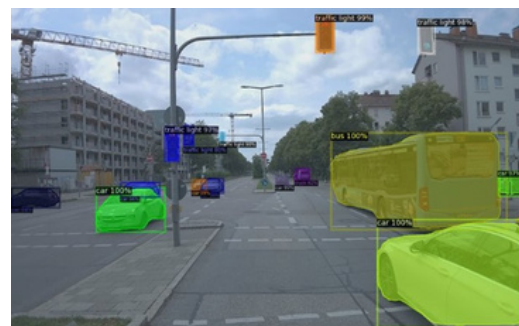
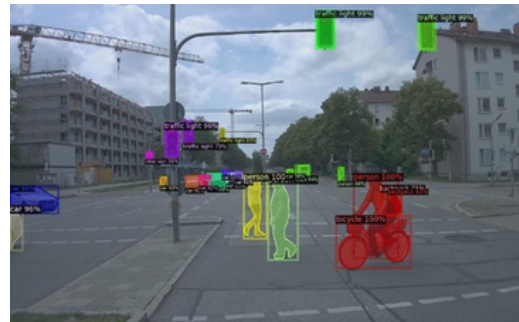
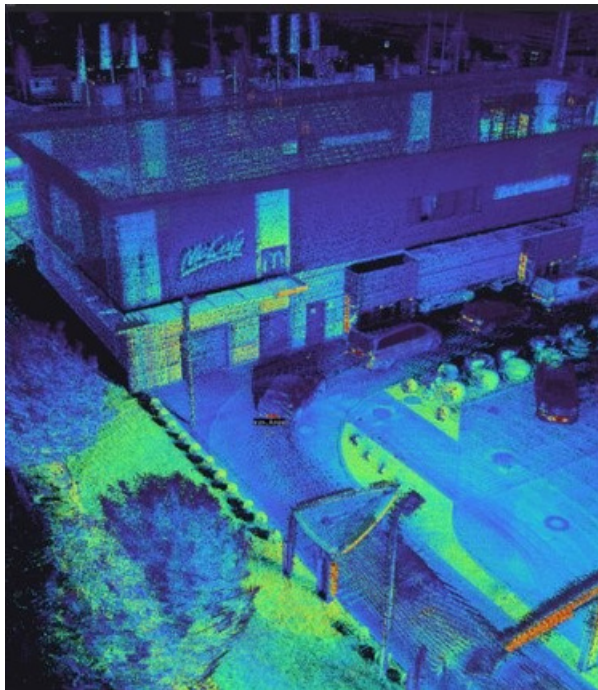
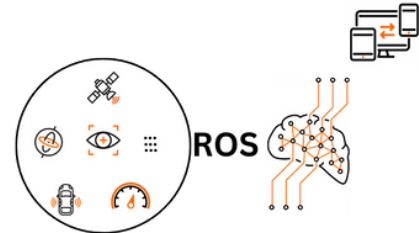




3. System Development

The design effort done in the initial phases of the project has paved the way for the development activities, which are currently underway. Key advancements include:

- The ROS2-based core framework, which has been largely implemented and will serve as the backbone for communication between sensors and algorithms.
- Progress on localization algorithms, including initial versions of visual and LiDAR SLAM, and AI-based moving object detection, which are being developed and fine-tuned.



- The development of a web-based graphical interface, marking a paradigm shift from previous ANavS desktop solutions and providing a more flexible and powerful visualization platform.



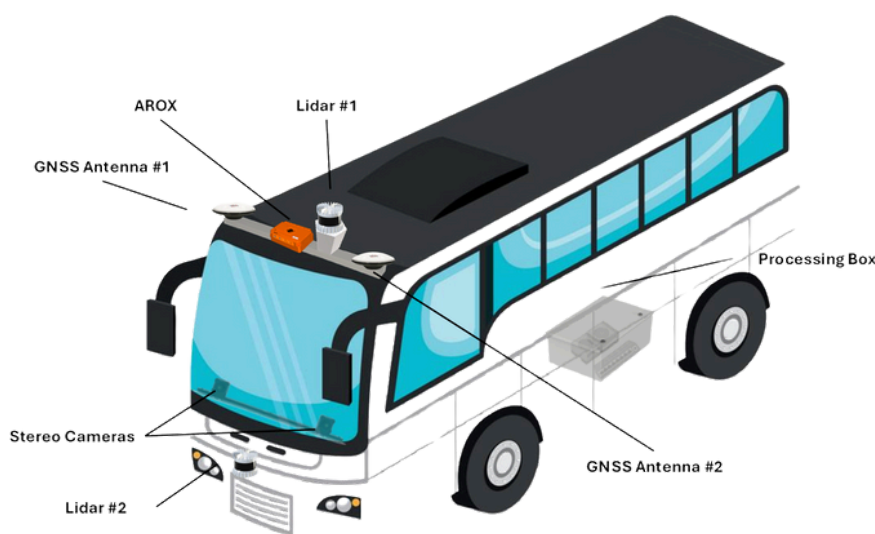
4. System Validation

Our team has meticulously designed a comprehensive verification campaign to validate the system's performance. The Test Plan, Test Cases, and Procedures document outlines:

- Realistic test scenarios that comprehensively validate system functionalities.
- Ground truth methods to accurately benchmark system performance.

This verification strategy is crucial in preparing for the upcoming Test Readiness Review (TRR) milestone, ensuring that the system meets all predefined requirements before final validation.

During this first year of the project, we have extensively work on preparing the datasets that will be the basis for the algorithms training and validation. Covering both the adaptation of public data and the creation of in-house datasets, such as those for spoofing and jamming detection.





5. Next Steps

Beyond the technical aspects, our business and dissemination activities have been progressing in alignment with our goals. The approved Dissemination Plan has driven key initiatives, such as:

- Launching the DREAM website, newsletters, brochures, and social media updates to engage with our growing community.
- Development and refinement of a Business Plan, focusing on commercial potential and market opportunities.
- Ongoing discussions with distributors and stakeholders to explore collaborative opportunities and introduce the project's capabilities.



6. Looking ahead

In the upcoming period, our efforts will focus on completing the development activities, including setting up and integrating the hardware system, further developing AI-based algorithms, and enhancing the system's localization and environment perception capabilities.

Once these tasks are completed, we will undertake an exhaustive verification campaign to ensure that all system requirements are successfully met.

Looking further ahead, we plan to conduct a demonstration campaign in the second half of the year, where the system's performance will be showcased on board a bus. This will provide an excellent opportunity to validate the system in real-world conditions.

Additionally, in the upcoming period, we will present the project's progress and main achievements at various forums and conferences. Stay tuned via our LinkedIn channel and website for further information.