

ADAS for modular vehicles



An advanced ADAS for modular vehicles providing full autonomy. The system enables the vehicle to autonomously summon, park, dock/undock, and perform basic driving manoeuvres



Tested in Milan



Developed by Next srl



administration@next-modular-vehicles.com



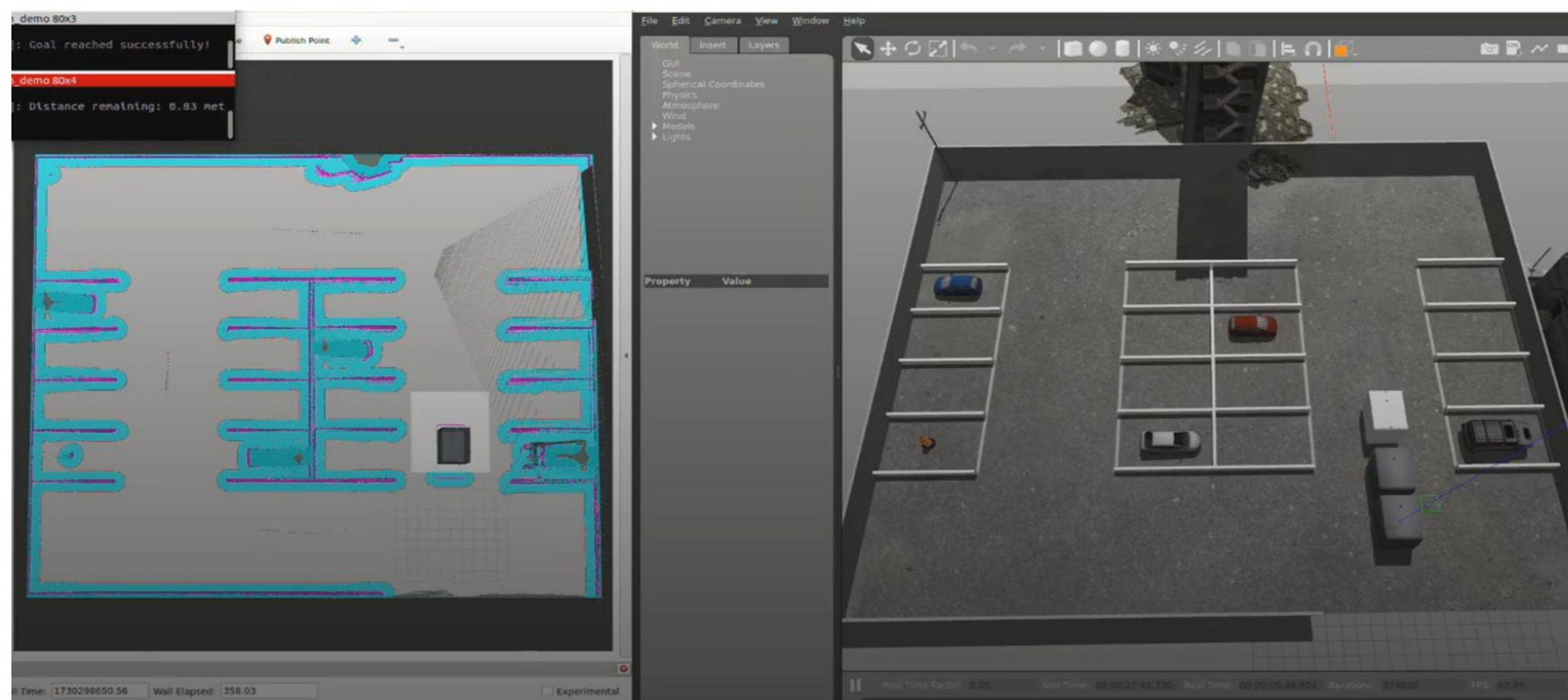
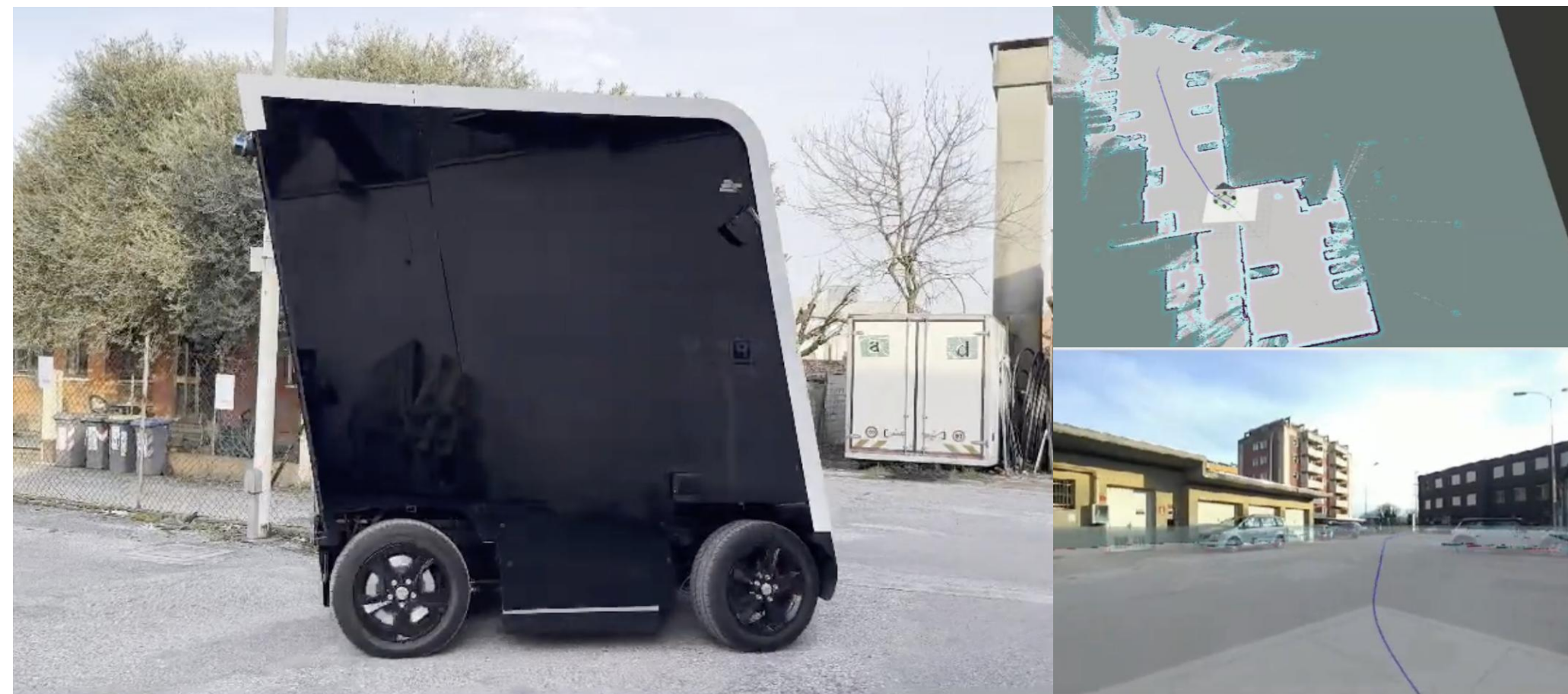
Data Requirements

- LiDAR point clouds for obstacle detection and 3D environment mapping.
- Depth Cameras for semantic understanding and visual localization.
- GPS/RTK and IMU data for global and local positioning.
- CAN bus signals for vehicle state (velocity, steering angle, brake status).



Decisions

- Detect and avoid static/dynamic obstacles in real time.
- Choose optimal trajectory to reach goal while respecting vehicle constraints.
- Decide whether to brake, steer, or stop based on environmental conditions.
- Automatically perform docking/undocking, parking, and remote summoning of the vehicle.
- Reliable, robust and safe docking/undocking control algorithm.



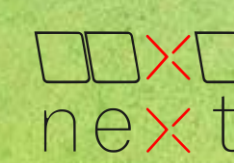
Methods

- The system is built on the ROS2 framework and follows a modular autonomous navigation pipeline.
- It uses LiDAR, Depth cameras, IMU, and GPS for environment perception and localization, with SLAM or map-based tracking depending on context.
- Global and local planners compute collision-free paths and adapt in real time to dynamic obstacles.



Scalability

- Sensors and key modules operate at 10–40 Hz depending on task
- CAN bus communications respect a cycle time < 5 ms, ensuring functional safety requirements for automotive applications (ISO 26262)
- The system is modular and scalable, applicable to different vehicle configurations with minor adaptation, and adaptable to different scenarios.



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