



# Test Environments for Artificial Co-driver in Dreams4Cars

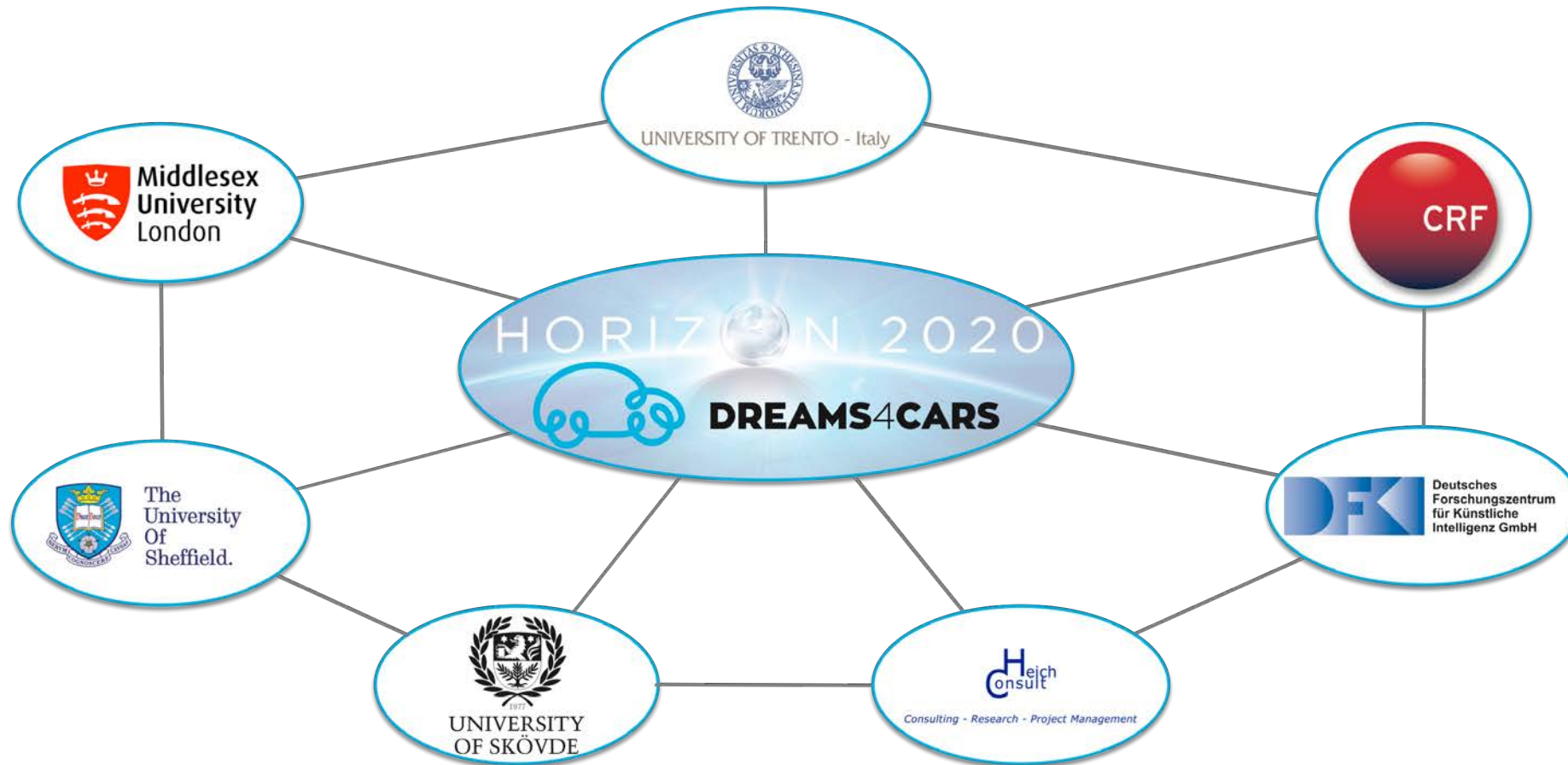
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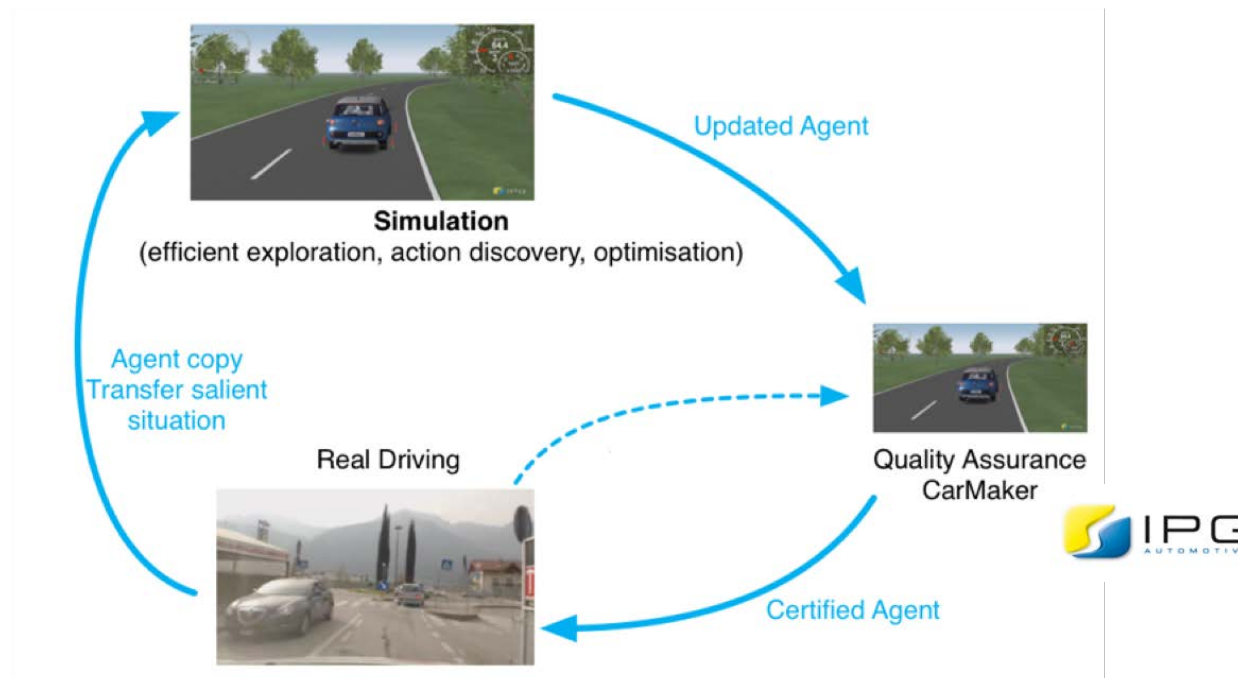
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731593

# The consortium

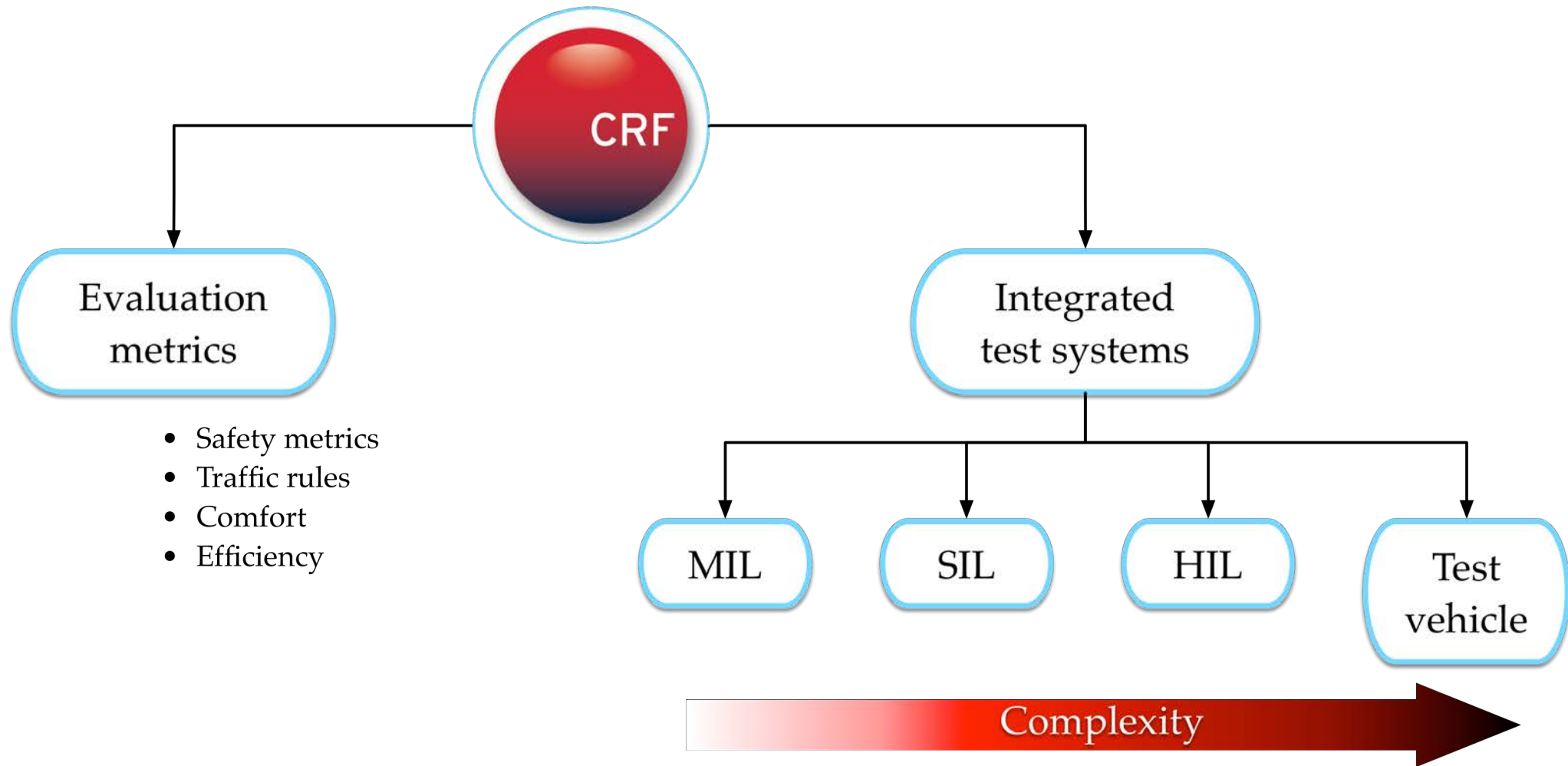


# Project purpose

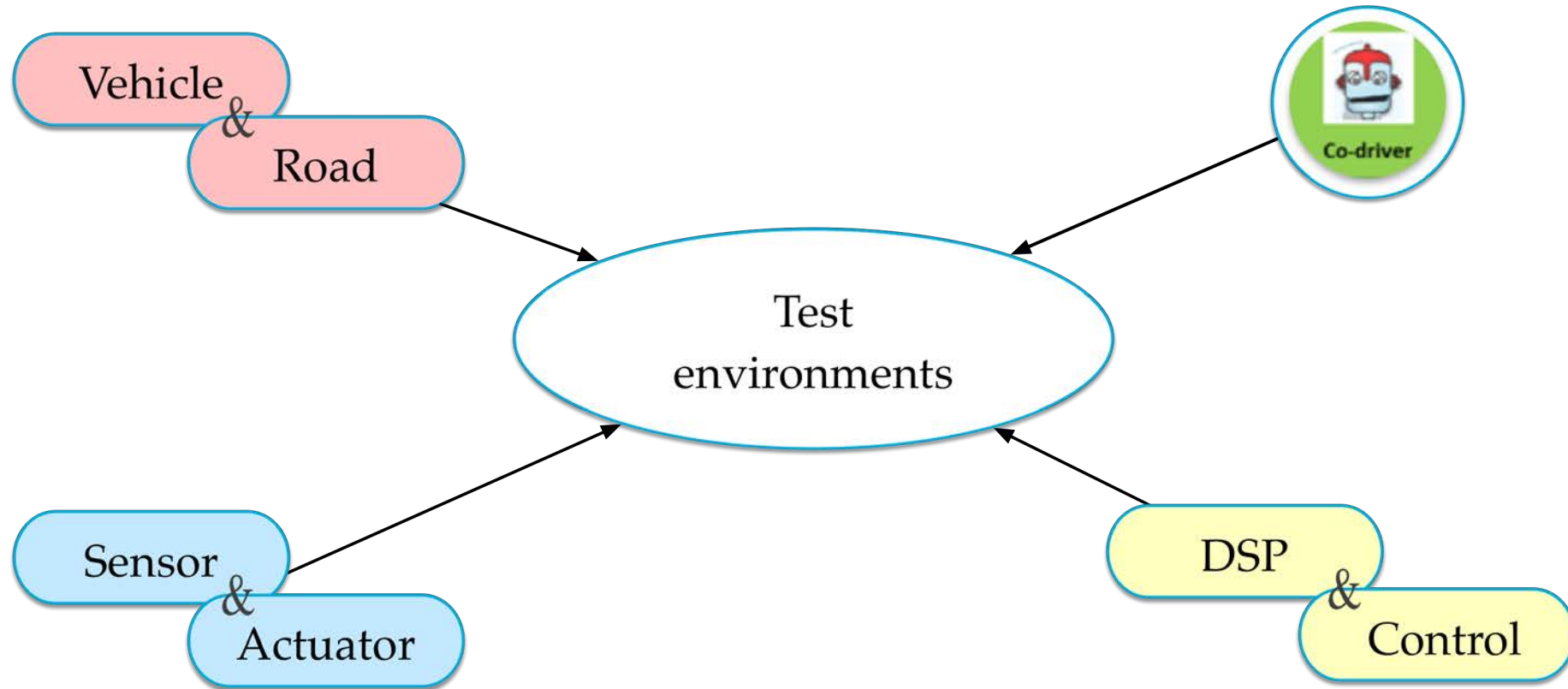
- Develop a **dream-like mechanism** where robots interact to develop and improve their Perception-Action system with particular focus on **critical** scenarios.
- The trained PA system will then be transferred back to the “live” system, **improving robot sensorimotor control in situations that have been dreamt.**



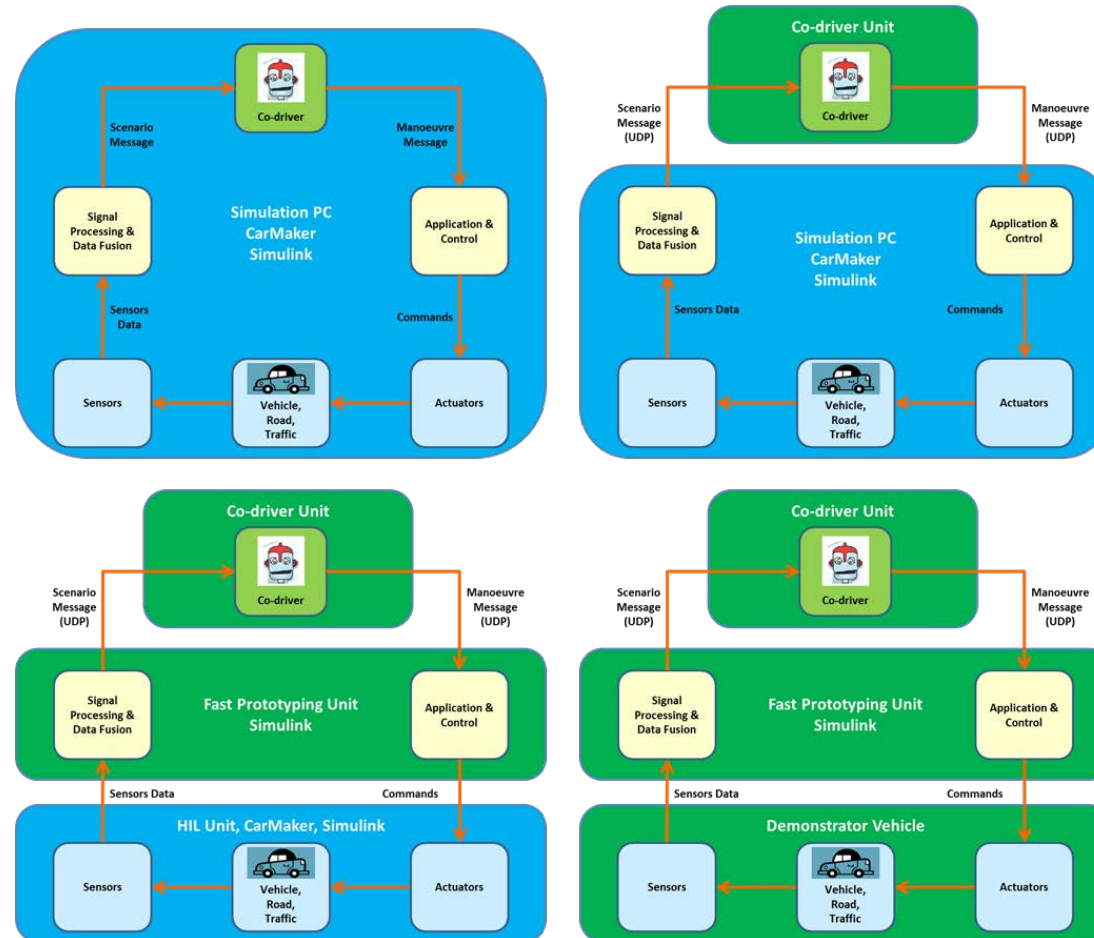
# CRF role in D4C



# Test environment – ingredients

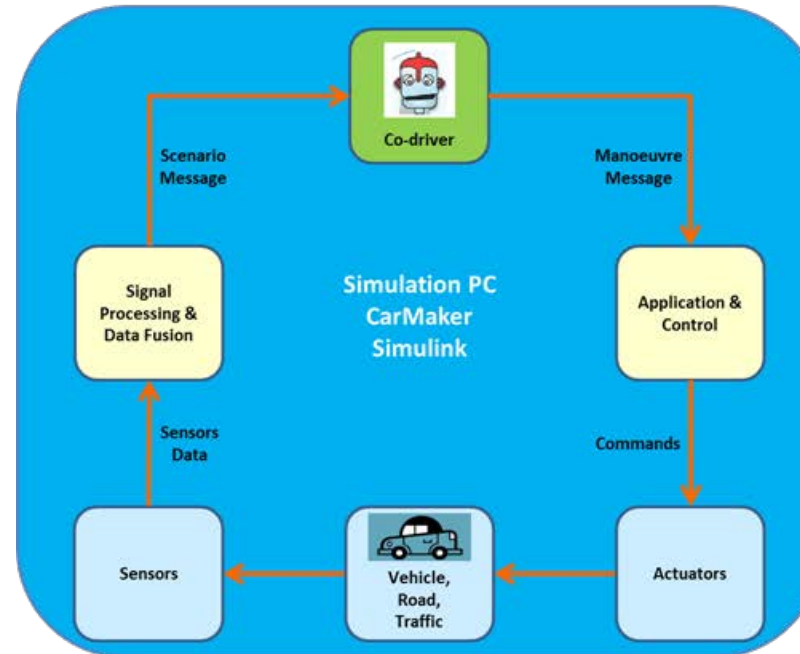


# Test environments

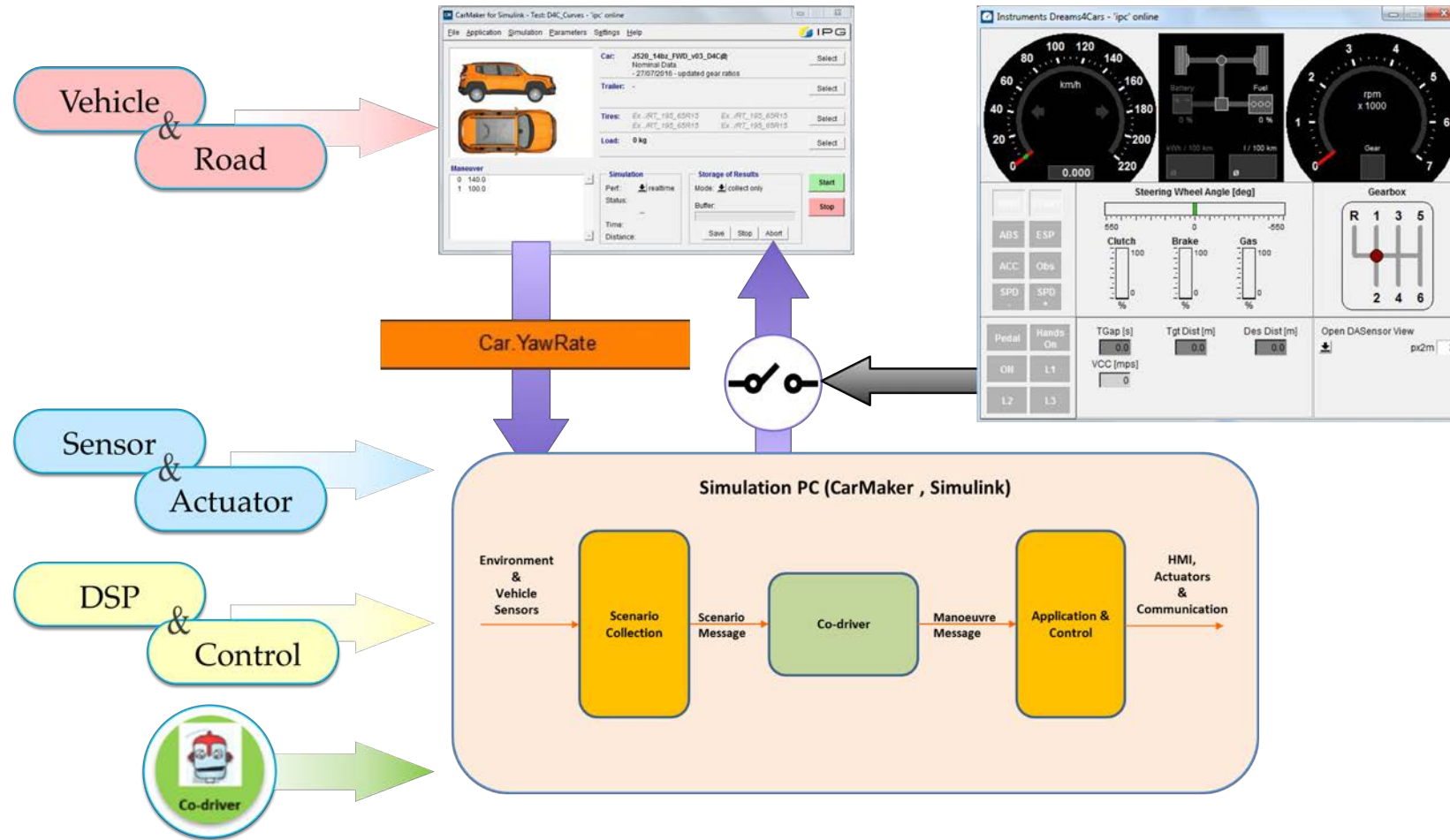


# Test environments

## MIL



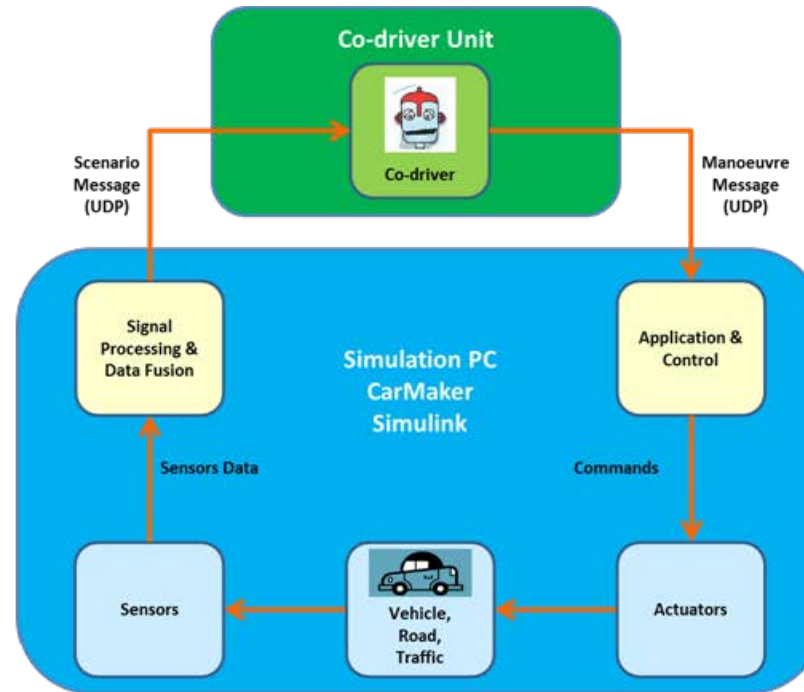
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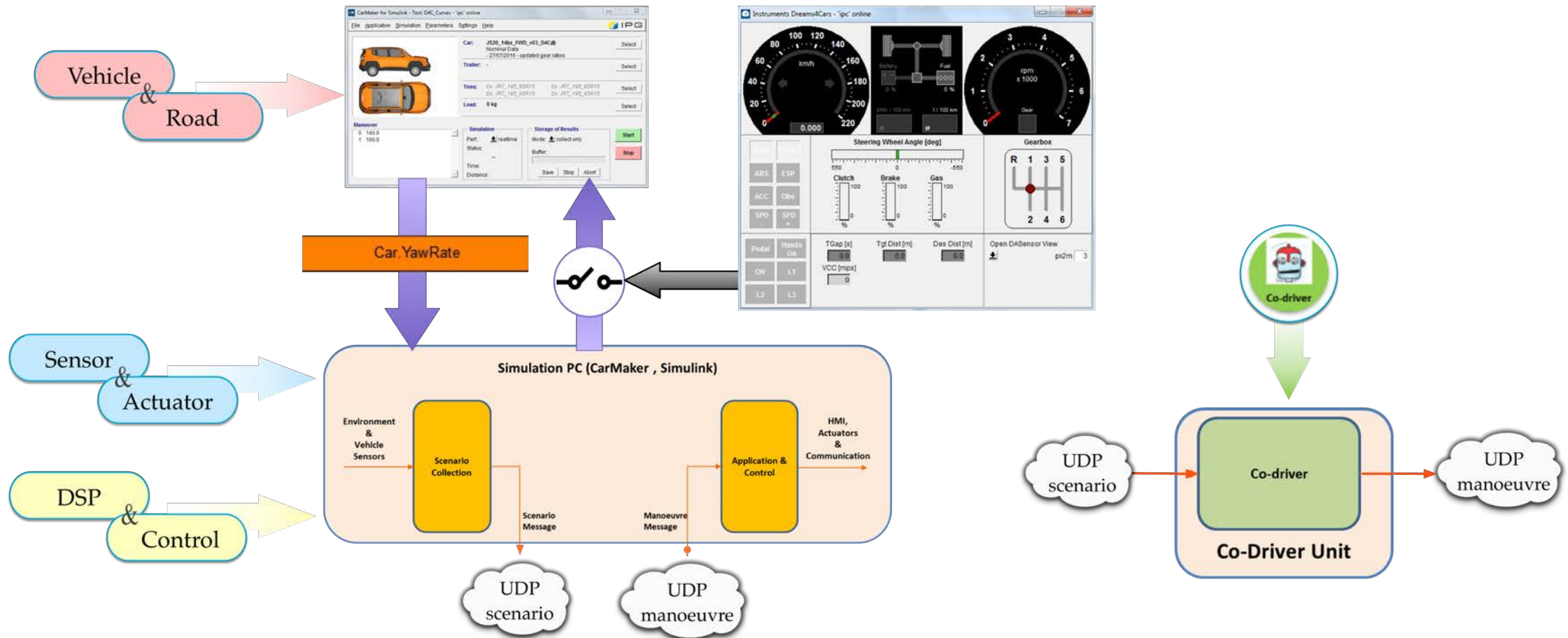


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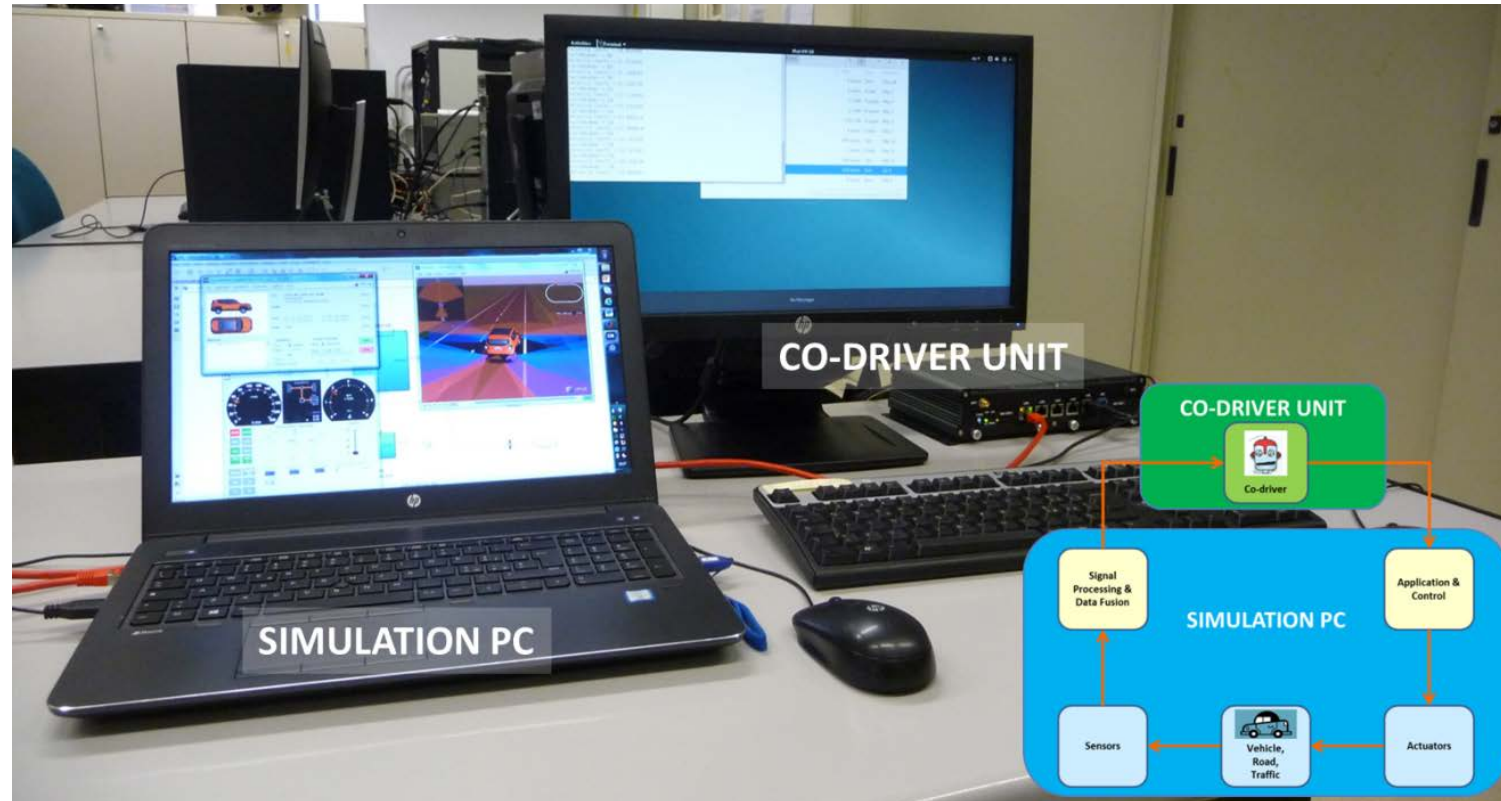
## SIL



# SIL

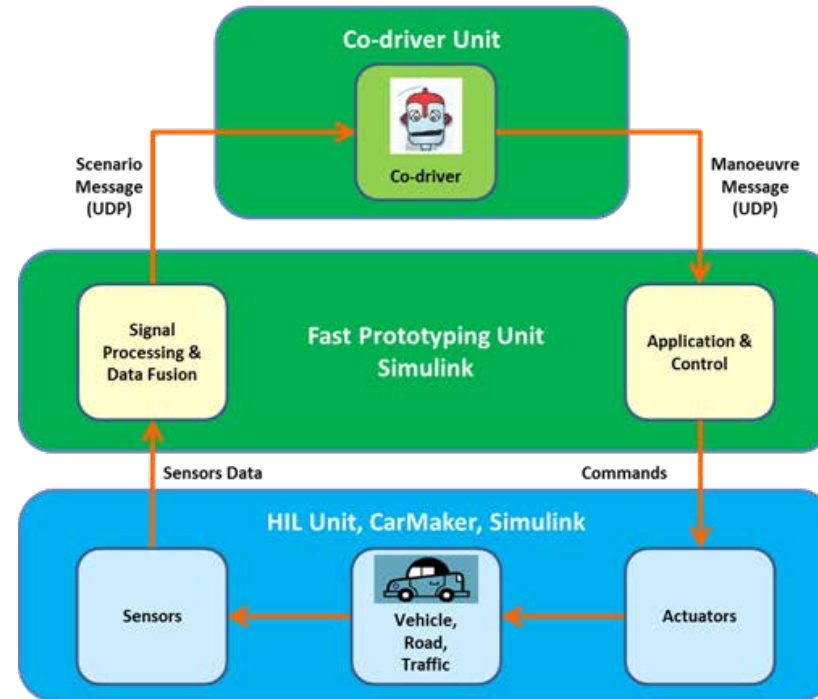


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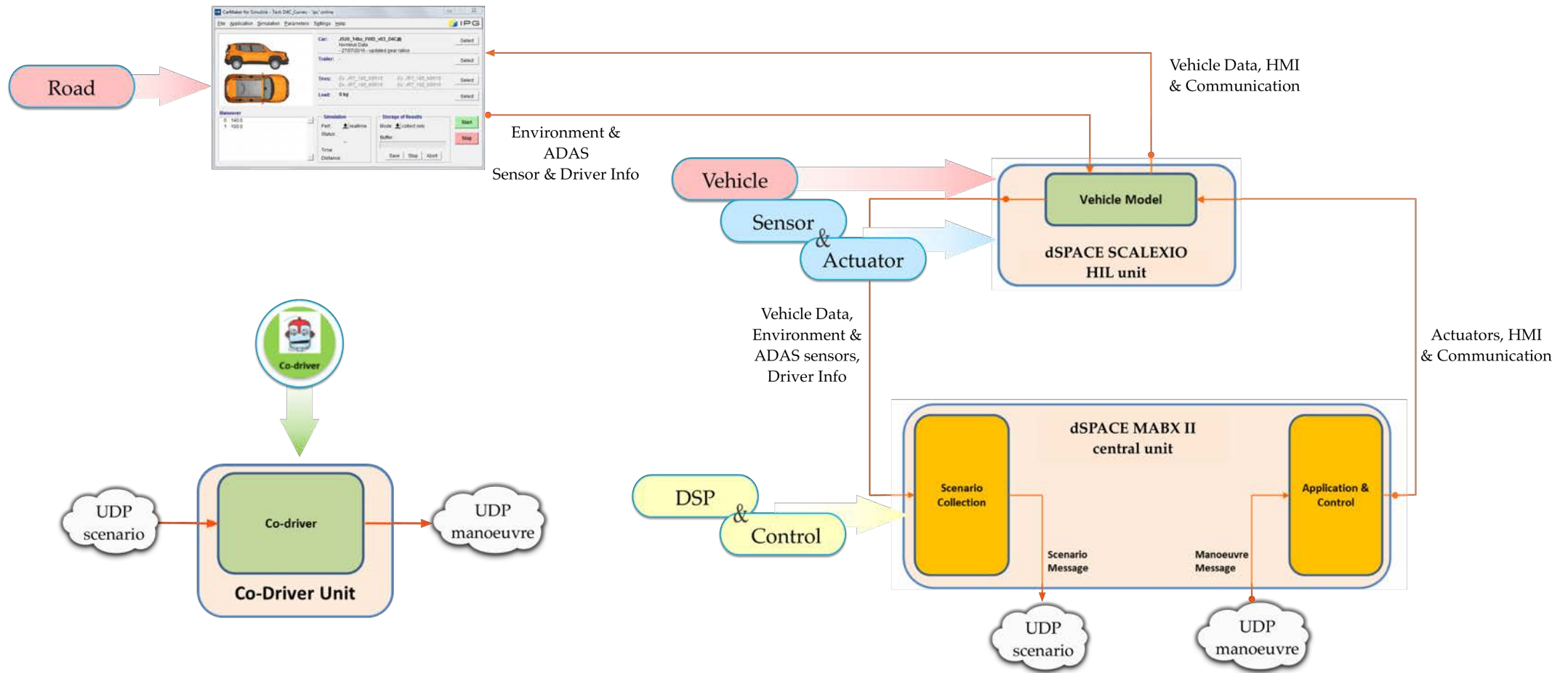


# Test environments

## HIL

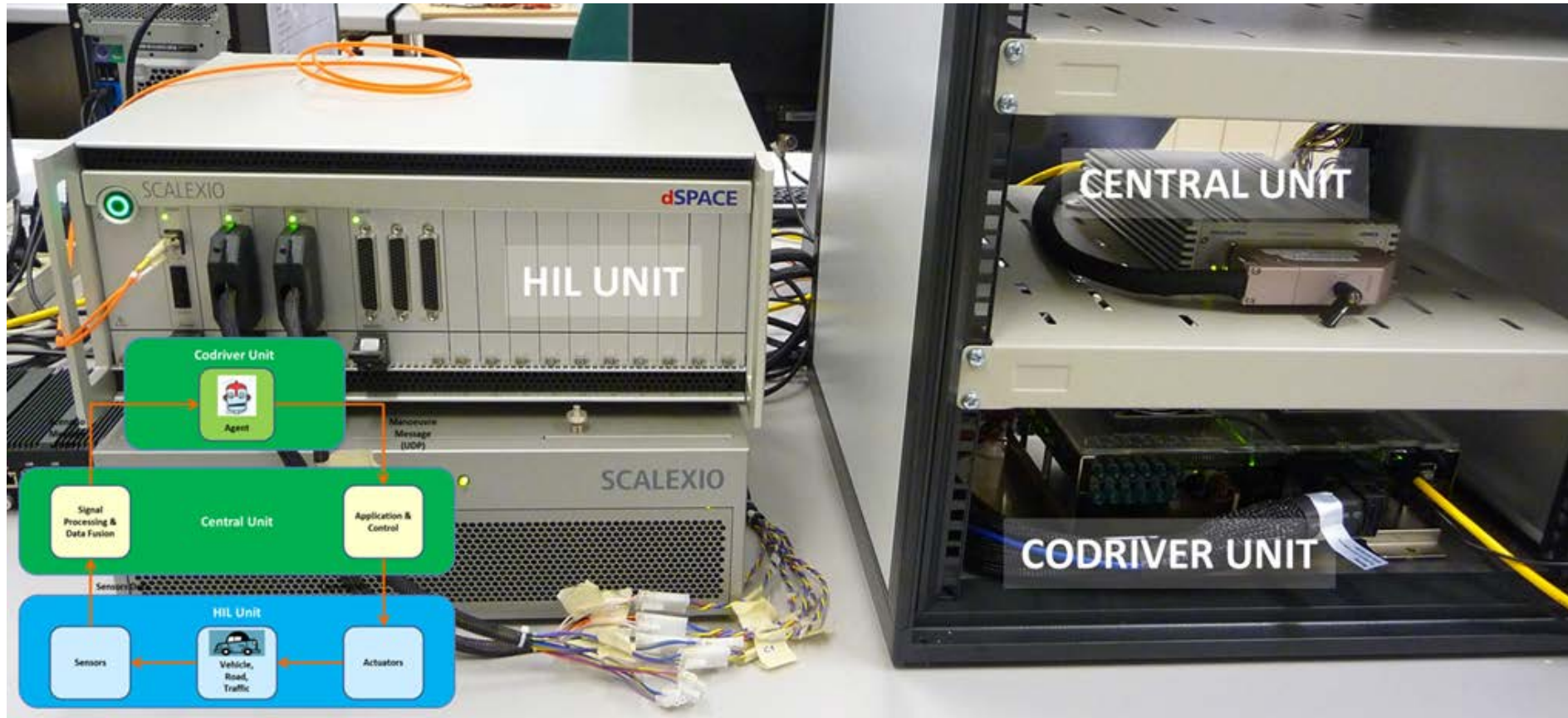


# HIL



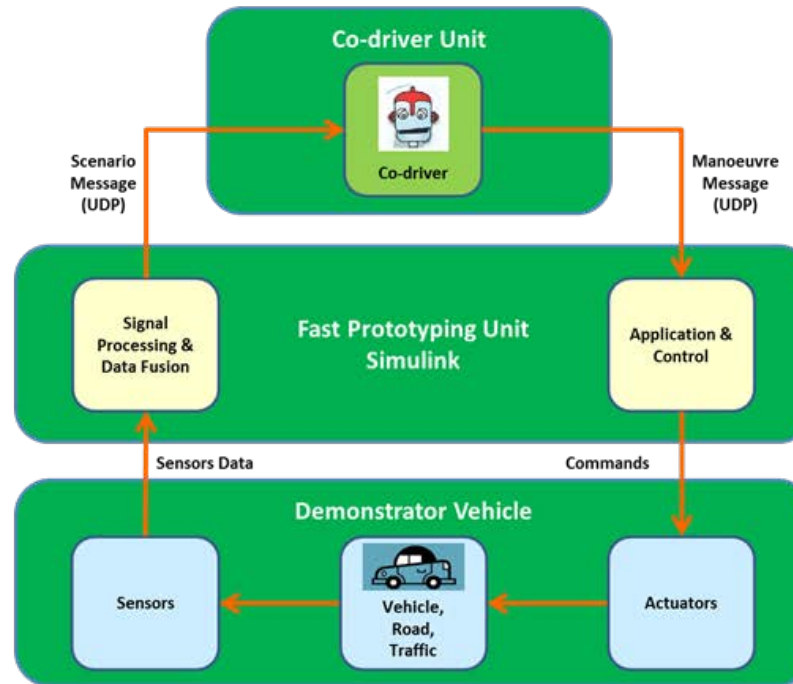


# HIL

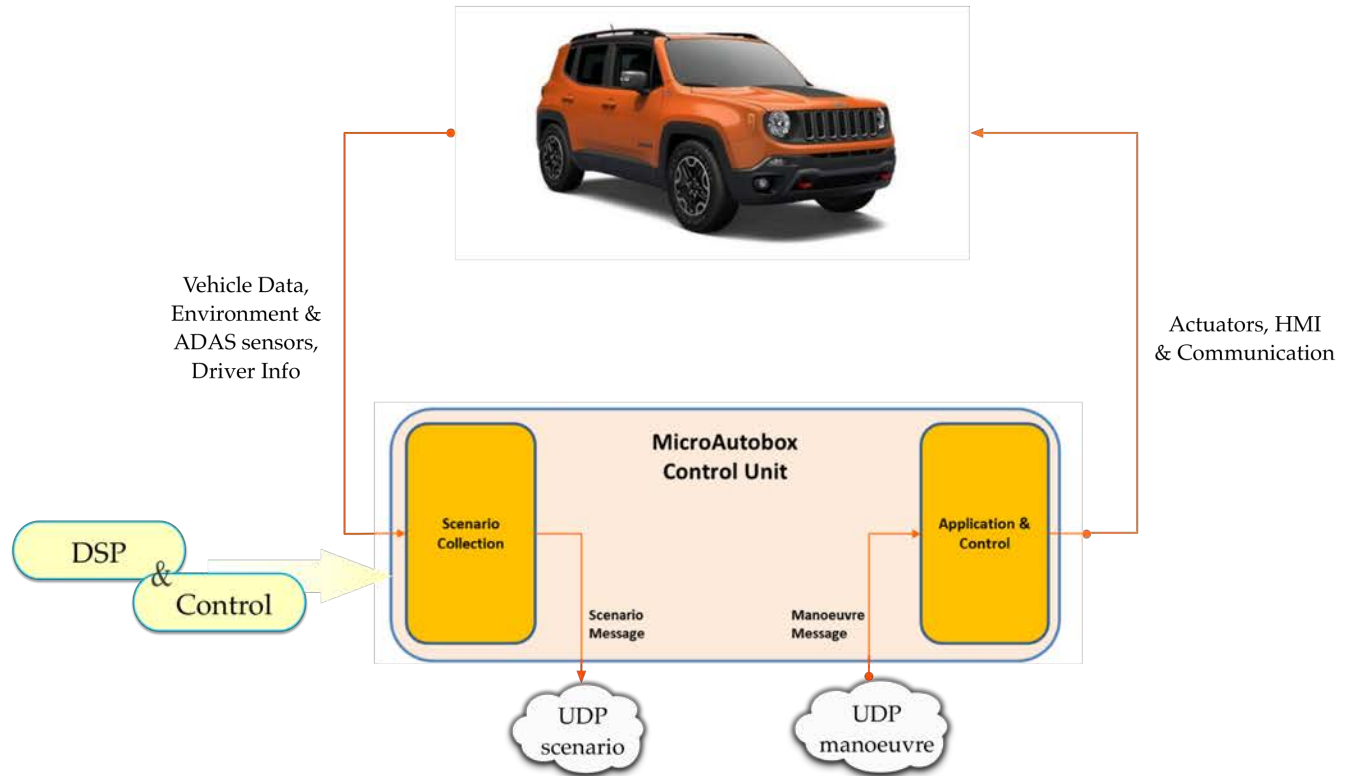
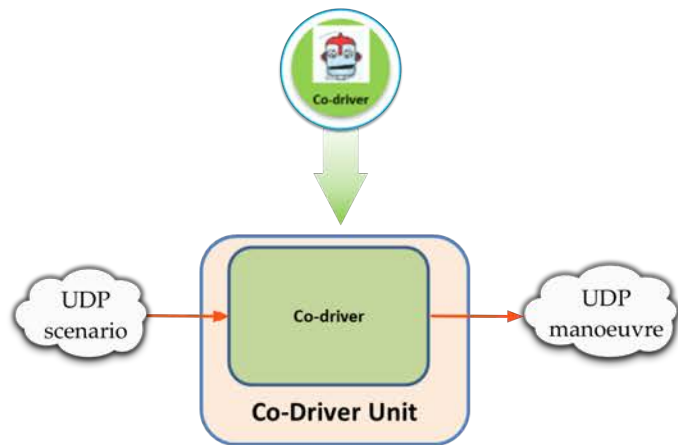


# Test environments

## Test Vehicle



# Test Vehicle

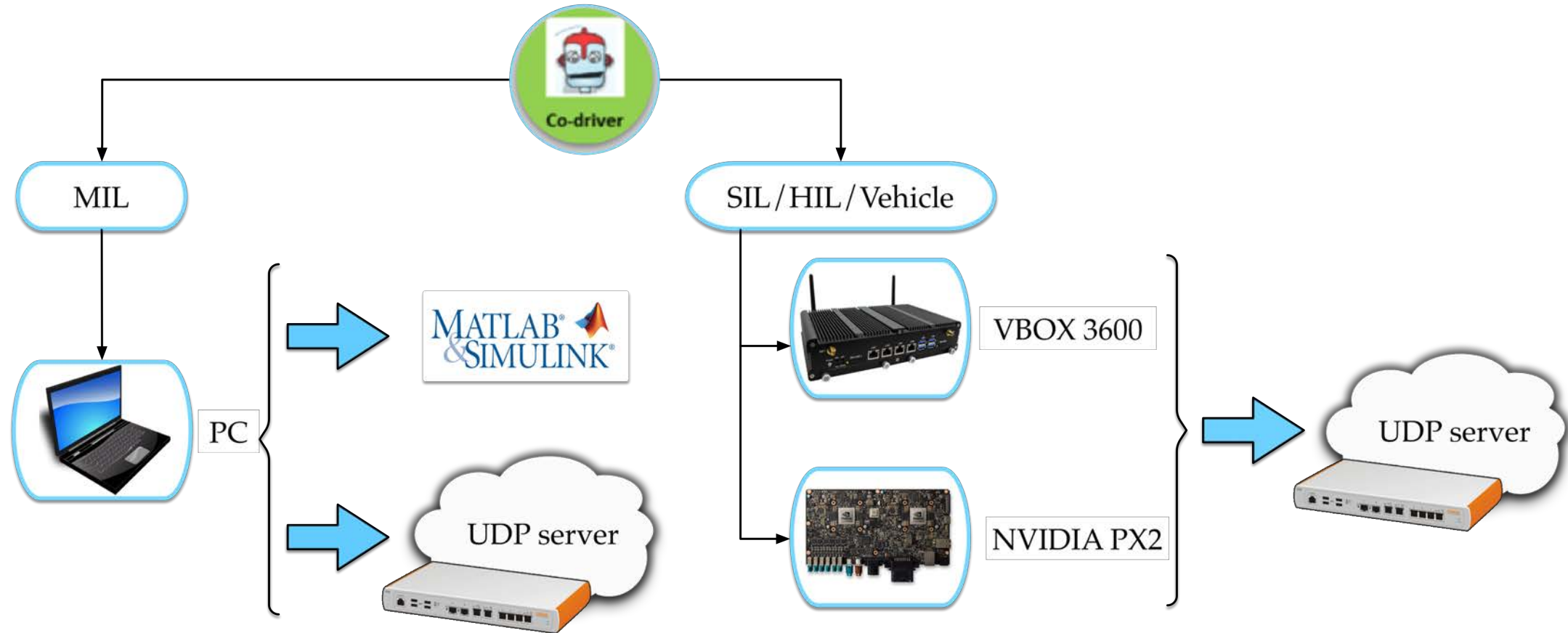




# Test Vehicle

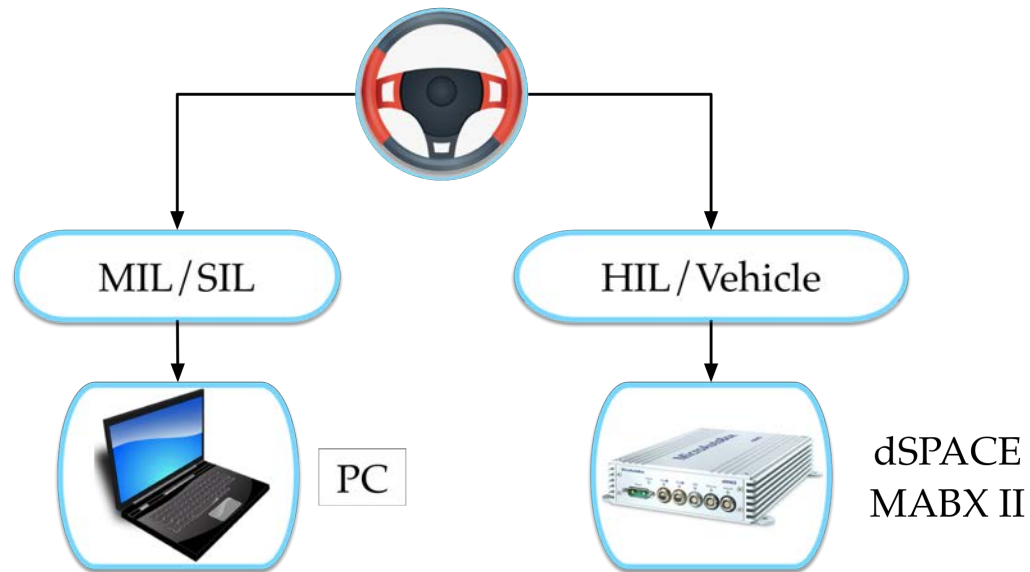


# Hardware setup – Co-driver



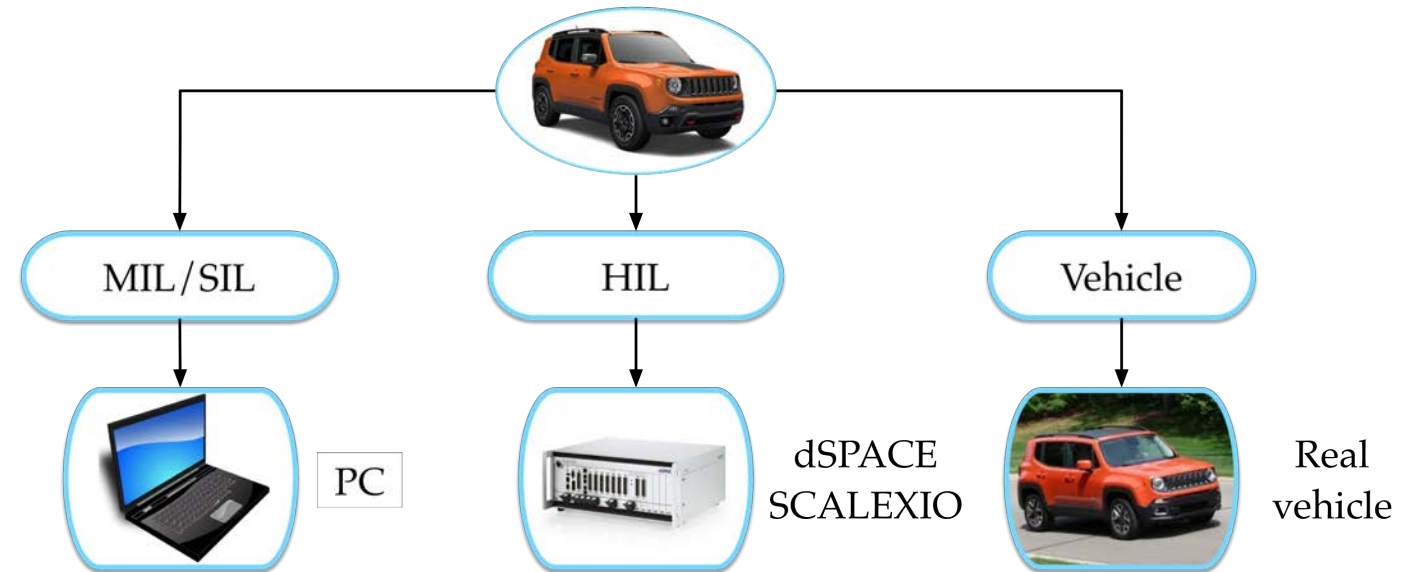
# Hardware setup – Sensor & Vehicle

## Signal processing & Control

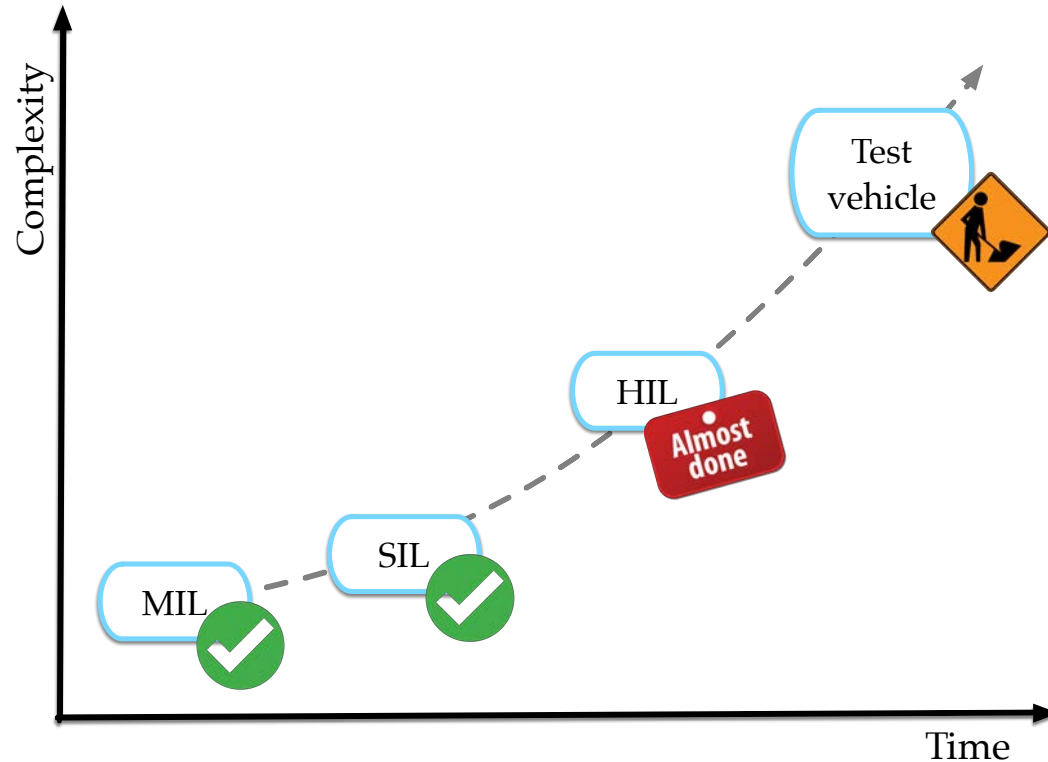


## Vehicle & Sensors

Front radar, front camera, front lidar, side ultrasound sensors, blind spot radar, GNSS receiver, Electronic Horizon




# Current status & further work



- Introduce more complex scenarios
- Evaluate metrics
- Simulations fidelity tests
  - Speed adaptation
  - Car following
  - Lane following
  - Overtaking

# Conclusions

- Increasing testing **complexity**:
    - ✓ Efficient software development
    - ✓ Rapid debugging
    - ✓ Reduced number of tests in real vehicle
  - Excellent **portability** of code among the different environments:
    - ✓ Same **Co-driver software** executed all the way from **MIL** to **Test Vehicle**
    - ✓ Same **Co-driver unit** implemented all the way from **SIL** to **Test Vehicle**
    - ✓ The **Signal processing & Control** are kept the same in **HIL** and **Test Vehicle**
-  Overall SW structure must be **designed** from the **beginning** in view of achieving and easing the workflow

***Thank you for your attention!***

# *Questions?*