ASAM OSI in Mixed-Reality applications

Using the Open Simulation Interface with real and virtual components

Technische Hochschule Ingolstadt

GEFÖRDERT VOM Bundesministerium für Bildung und Forschung

FORSCHUNG AN FACHHOCHSCHULEN

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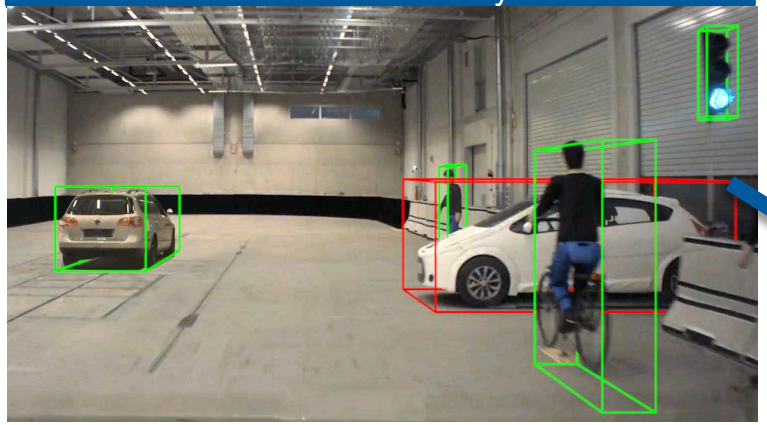
ASAM Association for Standardization of Automation and Measuring Systems

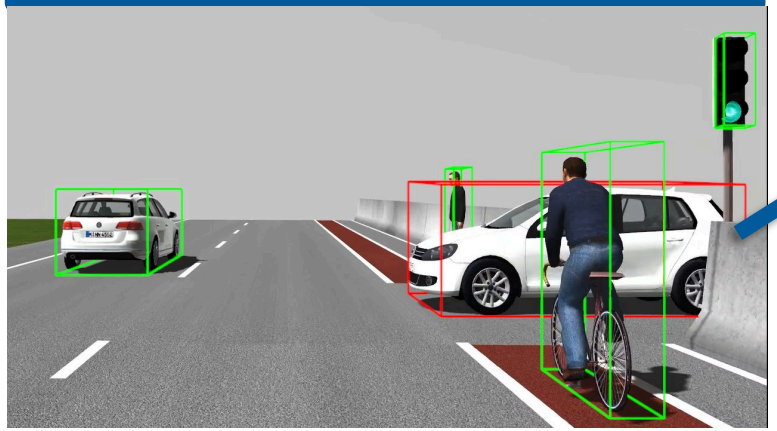
Mixed-Reality

Idea and Concept (Visualization)

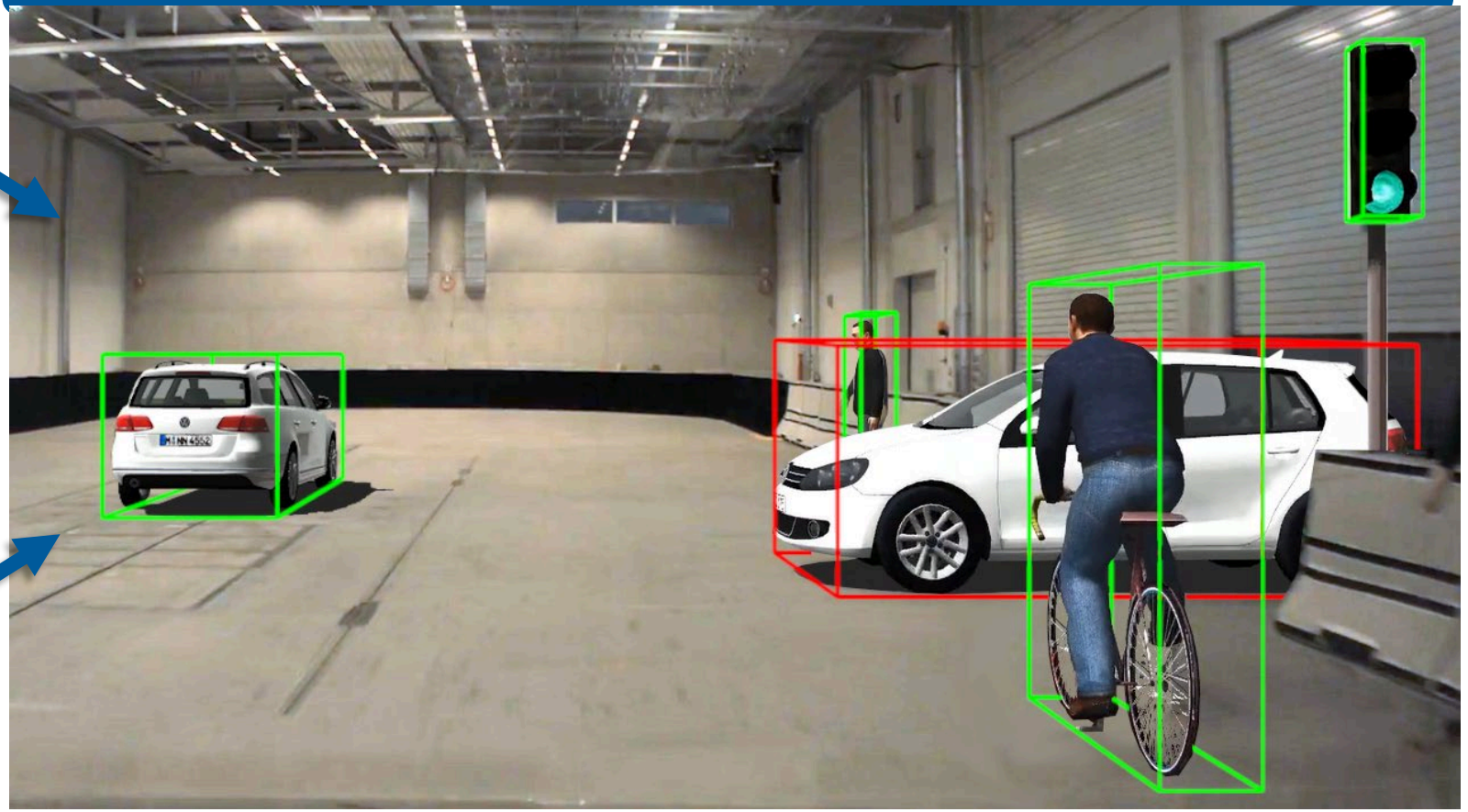
Indoor test facility



Simulation



Mixed Reality Test Environment

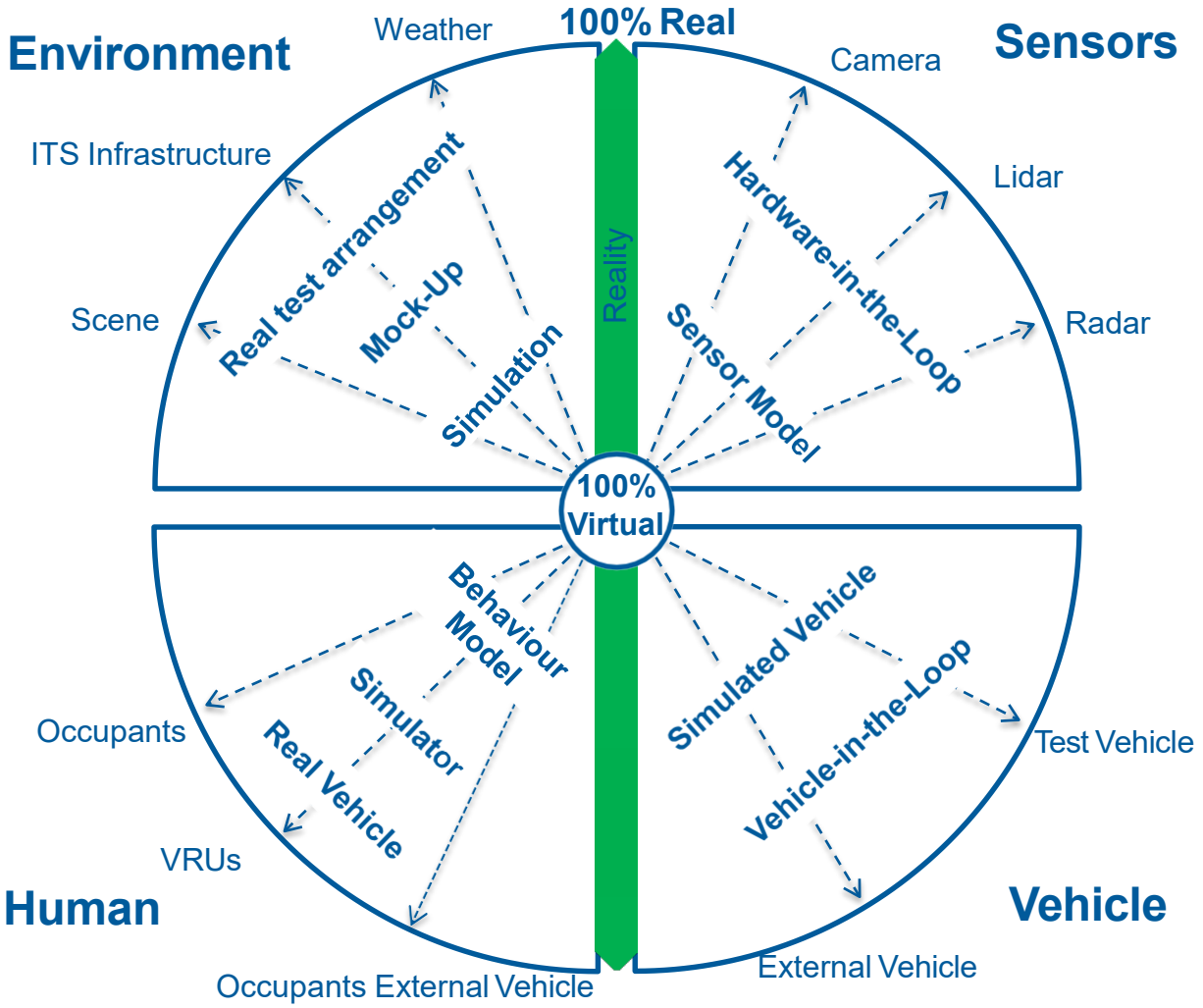


Mixed-Reality

Idea and Concept

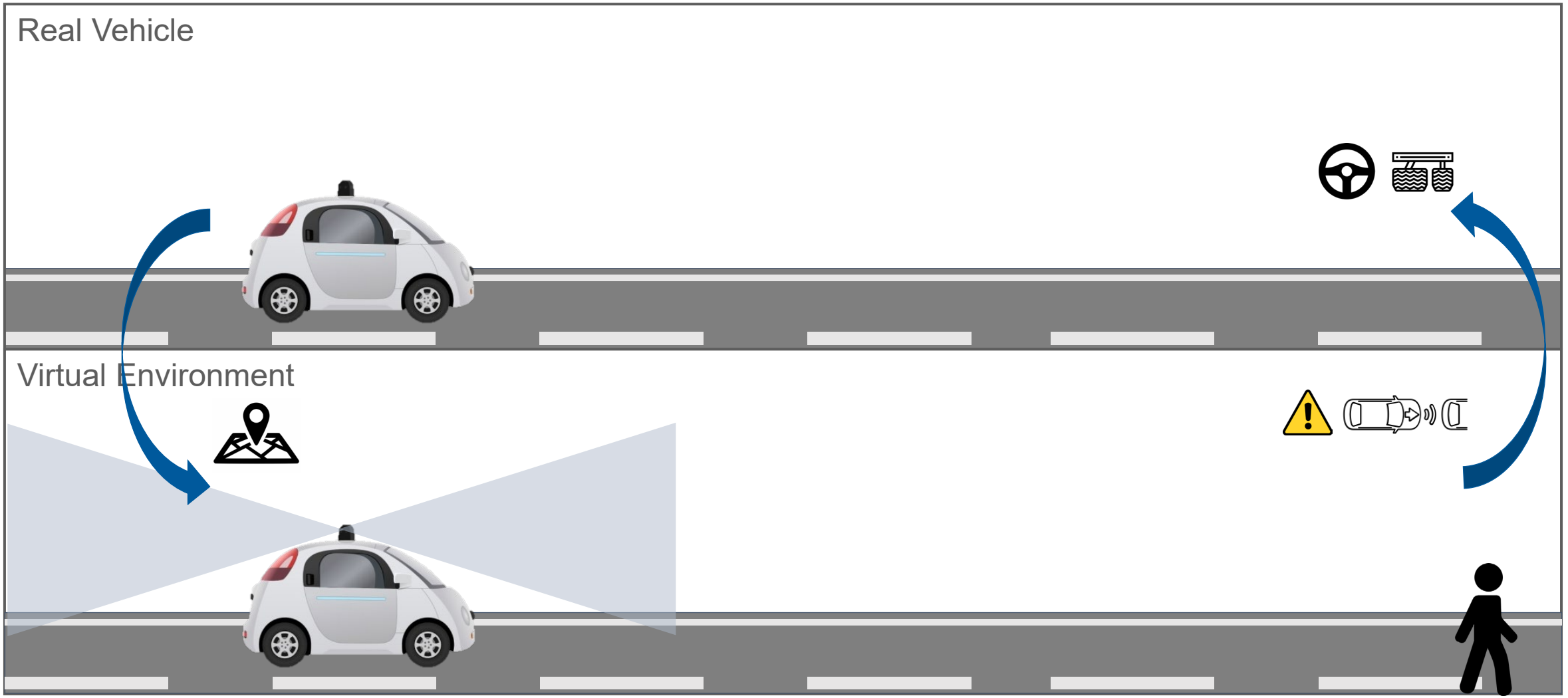
Scaling reality to have an optimal test environment for your system to test

- Reducing reality at axes, where it is **not needed**
- Reducing reality at axes, where it is **too dangerous** (e.g., vulnerable road users in emergency situations)



Mixed-Reality

Use-Case and First Approach



Mixed-Reality

Real Implementation and Extended Approach

Mixed-Reality and OSI

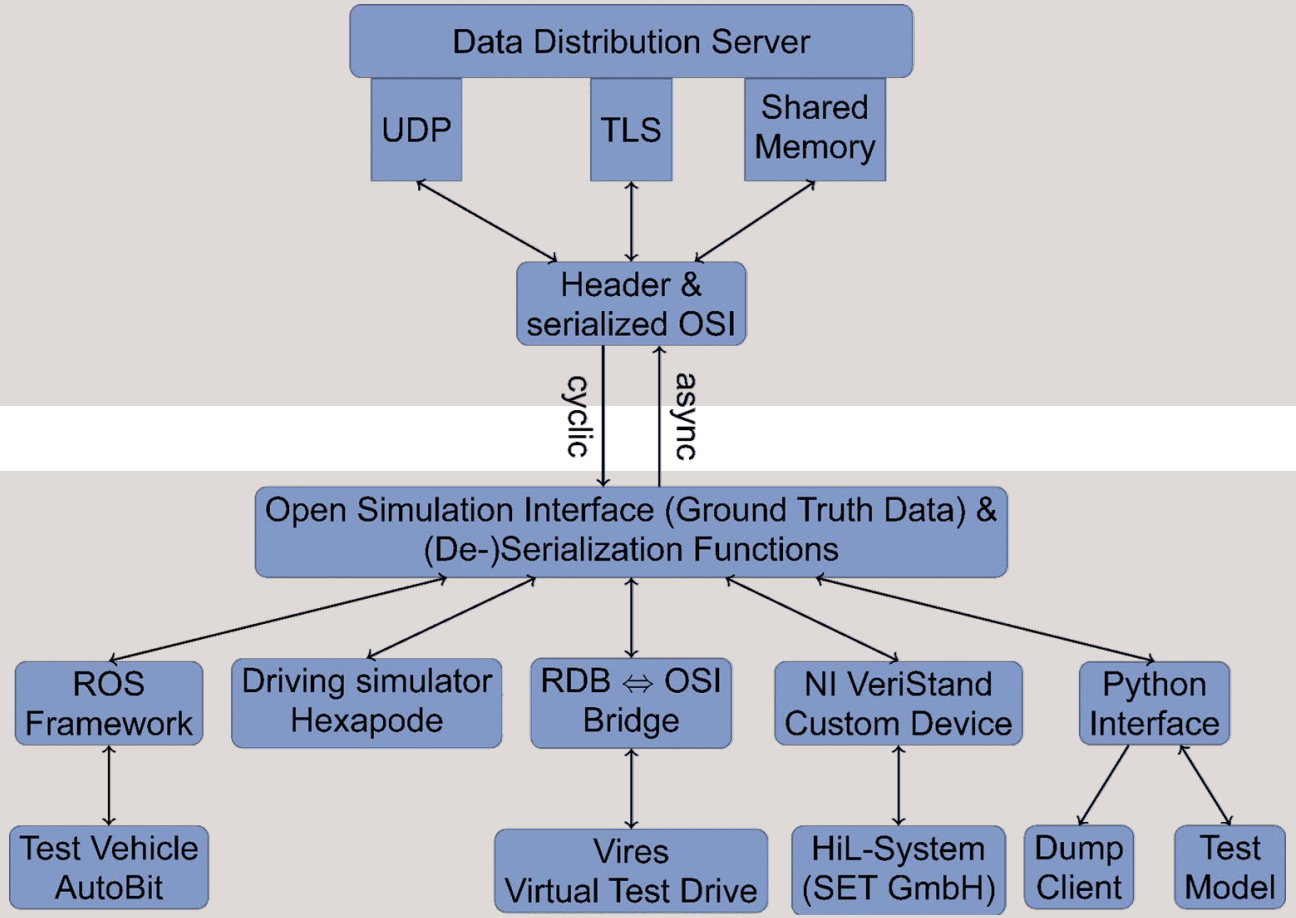
OSI as an enabler

- **Centralized server** exchanges Data between OSI-agents
- **OSI – GroundTruth** message as basic supported data type

→ Exchanges everything that can be seen from “god view”

- **Single agents** e.g., Vehicles, Pedestrian, cyclists, etc.
- Containing **component models**, e.g., behavior models, sensor models, etc.

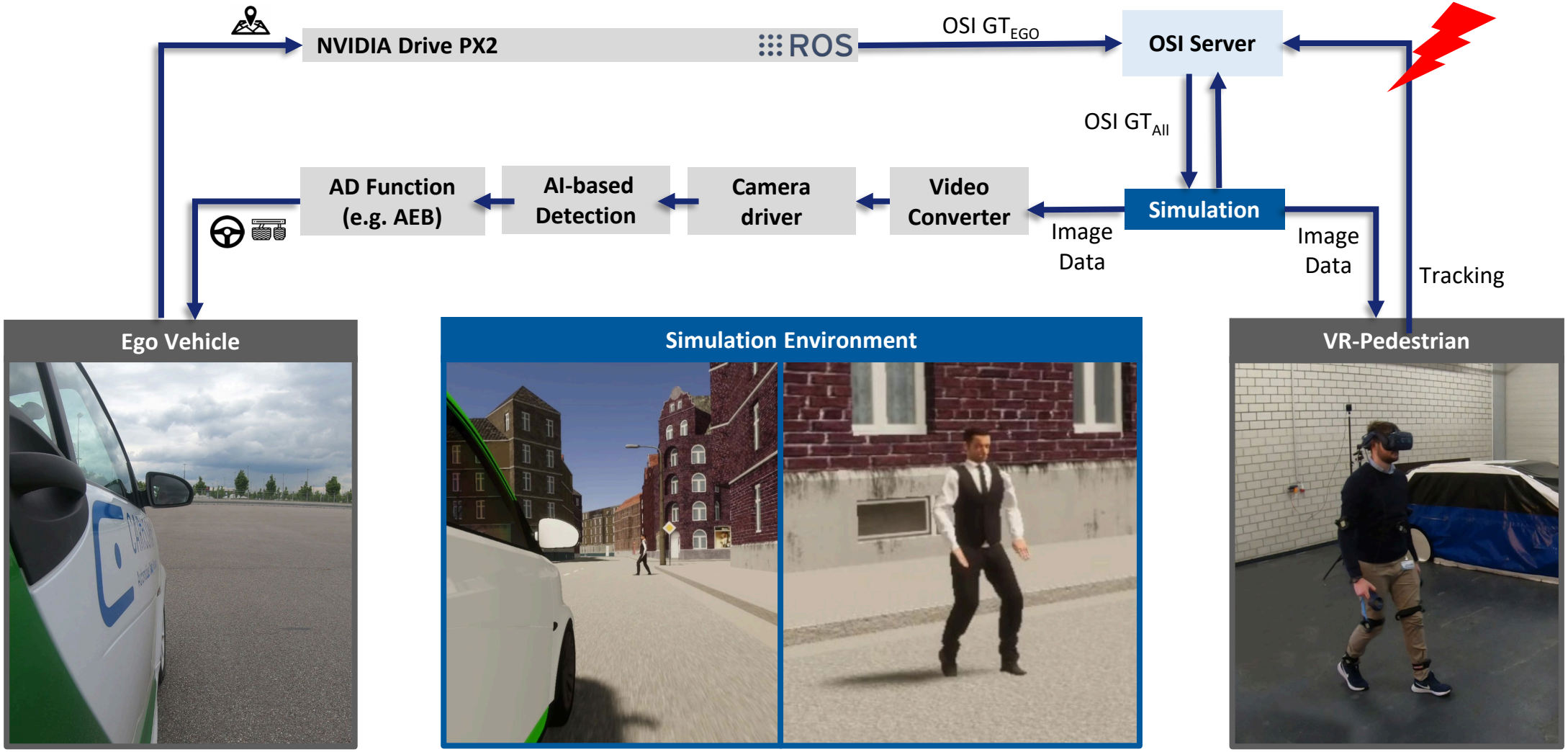
→ Contains all information and behavior of one agent within the test environment



Mixed-Reality and OSI

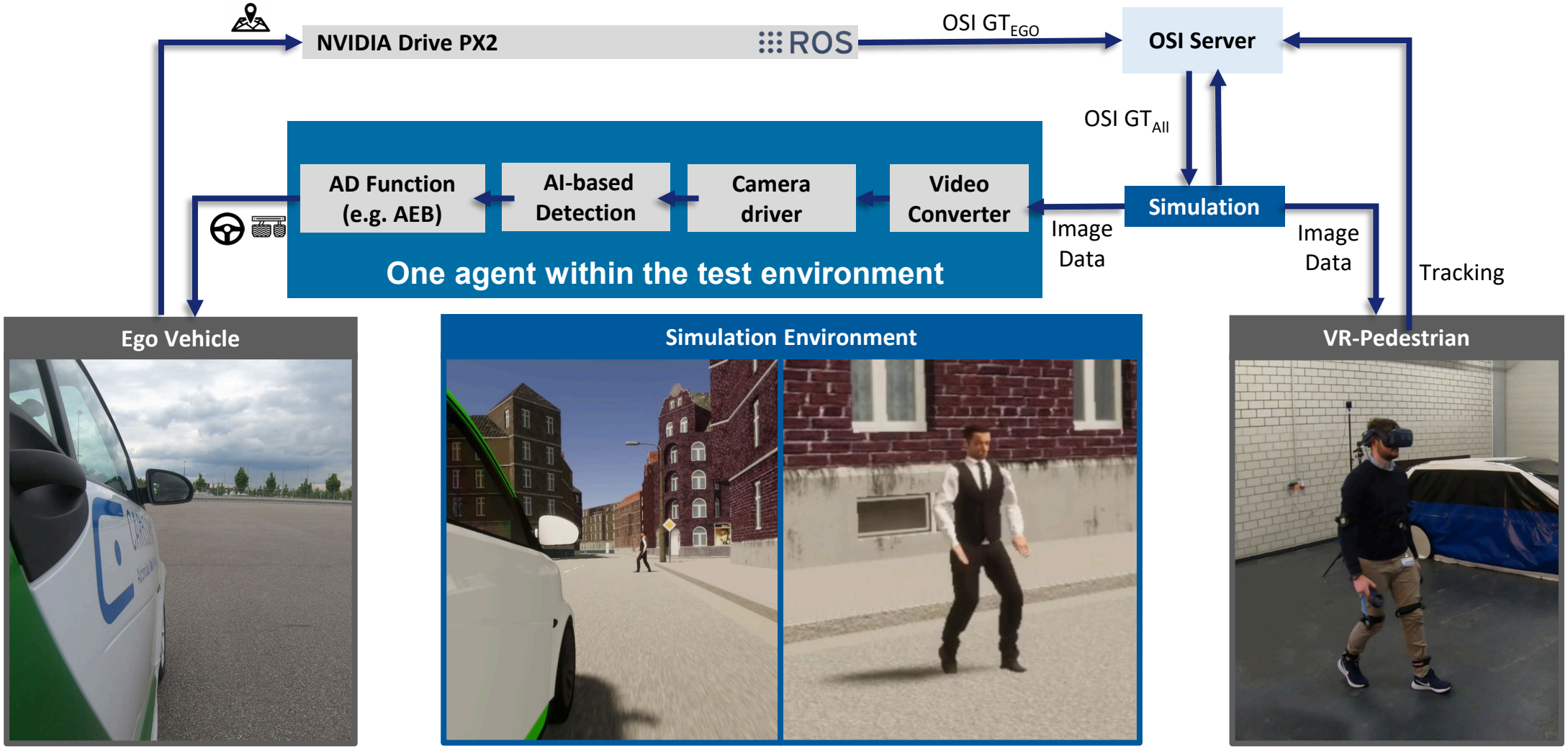
OSI as an exchange format between agents

A pedestrian model is work in progress



Mixed-Reality and OSI

OSI as an exchange format between agents?



Mixed-Reality and OSI

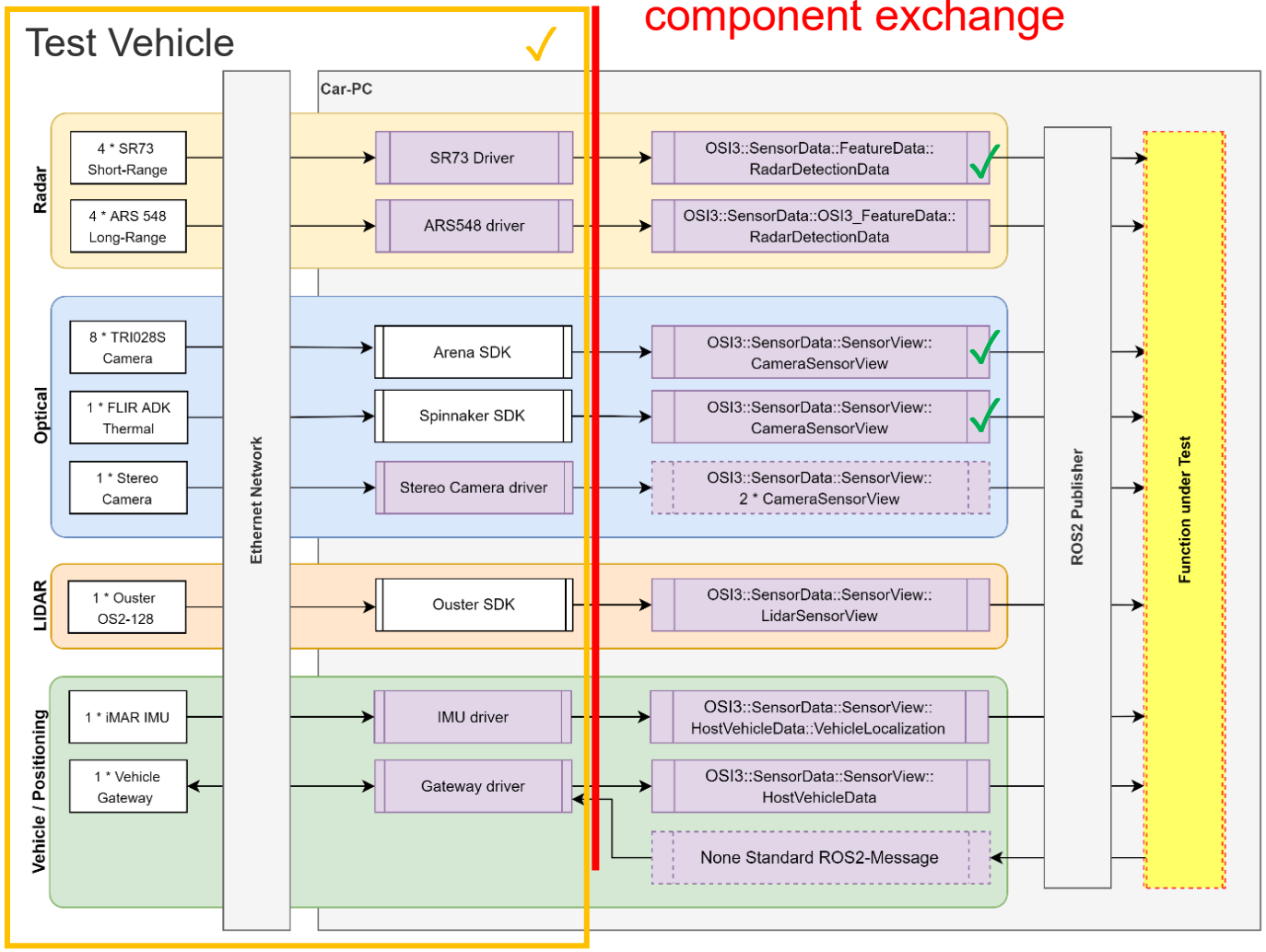
OSI as an exchange format between components **within** agents.

OSI enables flexible component exchange

A real test vehicle as an OSI agent

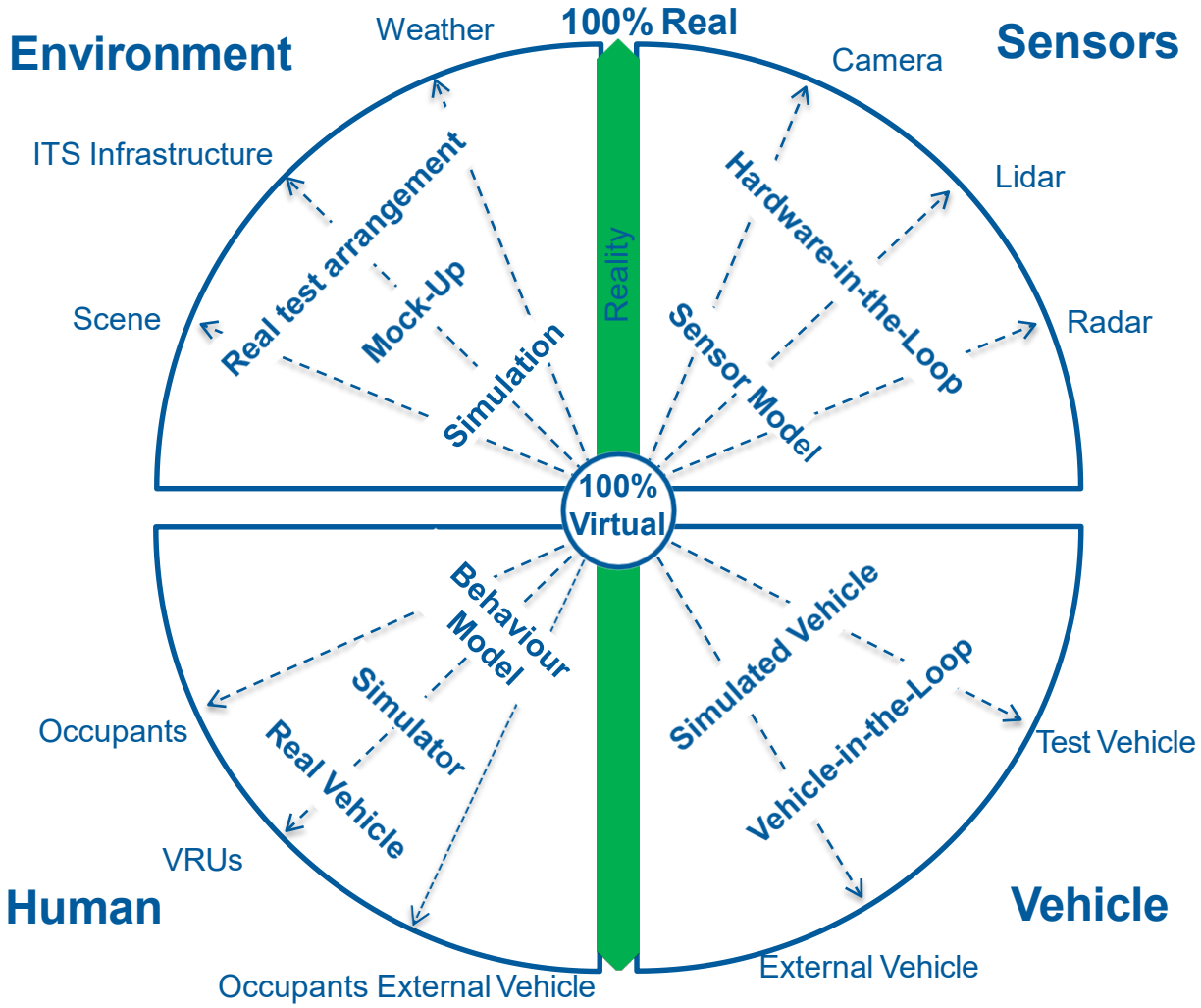
- Every internal vehicle components can be exchanged with virtual components
- Flexible data routing through ethernet based communication

→ **Work in progress**



Mixed-Reality and OSI

Summary



The **Open Simulation Interface** is the core communication protocol between and within real and simulated components in our Mixed-Reality environment.

Thank you for your attention!

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