

# MODULAR AND SCALABLE DRIVING SIMULATOR HARDWARE AND SOFTWARE FOR THE DEVELOPMENT OF FUTURE DRIVER ASSISTANCE AND AUTOMATION SYSTEMS

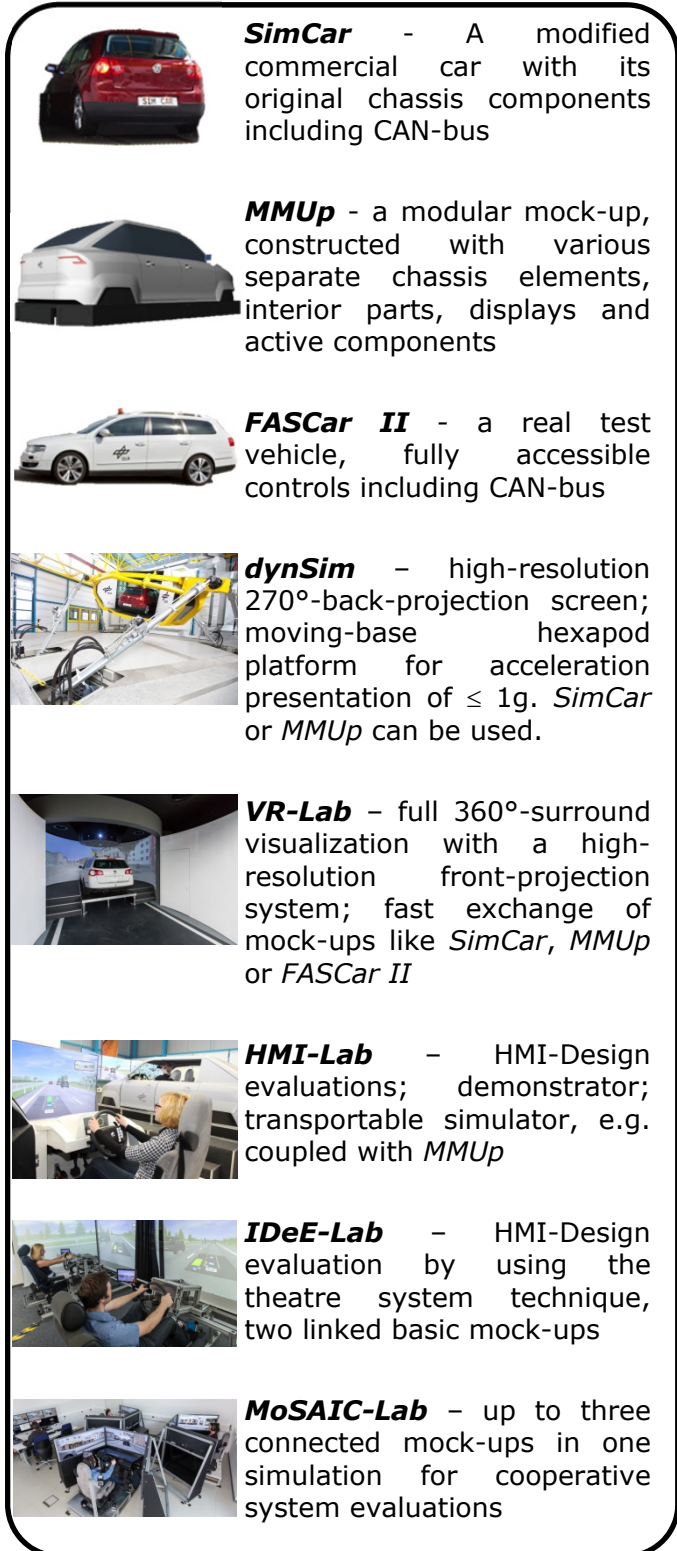
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**The DLR driving simulator landscape**, the supporting software architecture *Dominion* and several in-house developed simulation applications enable a model-based design for assistance and automation systems in a broad range of use cases, e.g.:

- early design evaluation and demonstration in order to find functional requirements for prototypes
- software- or hardware in-the-loop tests
- parameter calibration or
- high-fidelity evaluation test runs with a large number of test drivers for cooperative systems.

In order to enable a high degree of flexibility for a number of facilities, simulator platforms and mock-ups can be combined (almost) freely.



**SimCar** - A modified commercial car with its original chassis components including CAN-bus

**MMUp** - a modular mock-up, constructed with various separate chassis elements, interior parts, displays and active components

**FASCar II** - a real test vehicle, fully accessible controls including CAN-bus

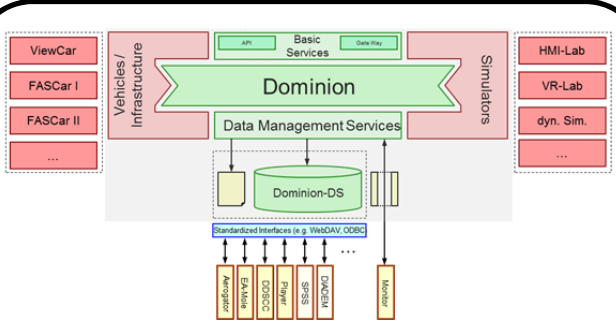
**dynSim** - high-resolution 270°-back-projection screen; moving-base hexapod platform for acceleration presentation of  $\leq 1g$ . *SimCar* or *MMUp* can be used.

**VR-Lab** - full 360°-surround visualization with a high-resolution front-projection system; fast exchange of mock-ups like *SimCar*, *MMUp* or *FASCar II*

**HMI-Lab** - HMI-Design evaluations; demonstrator; transportable simulator, e.g. coupled with *MMUp*

**IDE-Lab** - HMI-Design evaluation by using the theatre system technique, two linked basic mock-ups

**MoSAIC-Lab** - up to three connected mock-ups in one simulation for cooperative system evaluations



The system architecture *Dominion* developed by DLR is used in simulators as well as in test vehicles, thus transfer of soft- and hardware causes minimal migration effort.

- service oriented concept
- semiformal data and service description
- supporting tools for monitoring, data recording and laboratory operating
- supports standard interfaced e.g. TCP, UDP, CAN for coupling third party soft- and hardware