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On the way to a new driving simulator - Preparing the simulation environment

Zero Prototypes Summit 2022

18th – 19th May

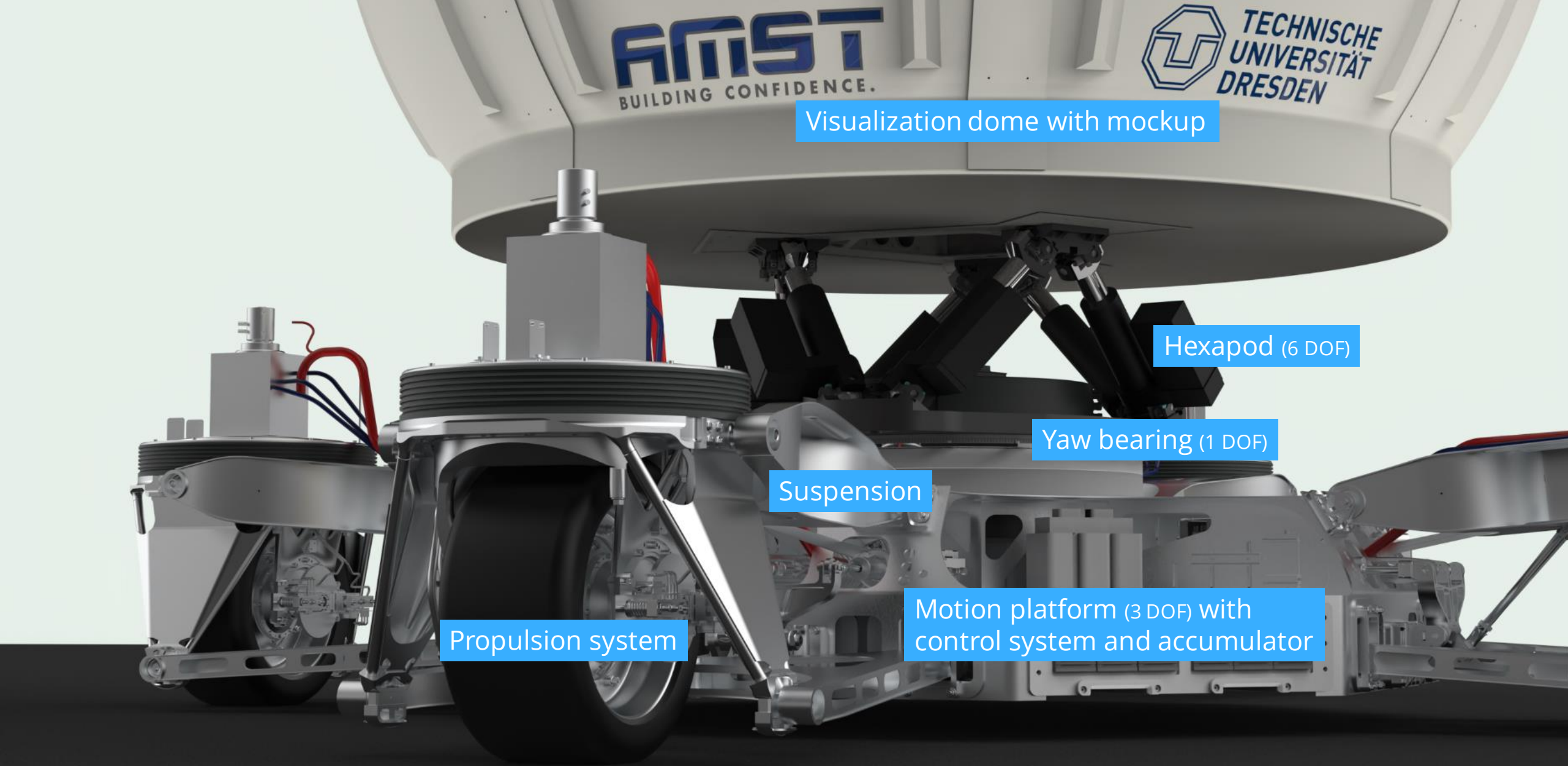


Motivation

Research Project TU Dresden – „Highly immersive driving simulator“



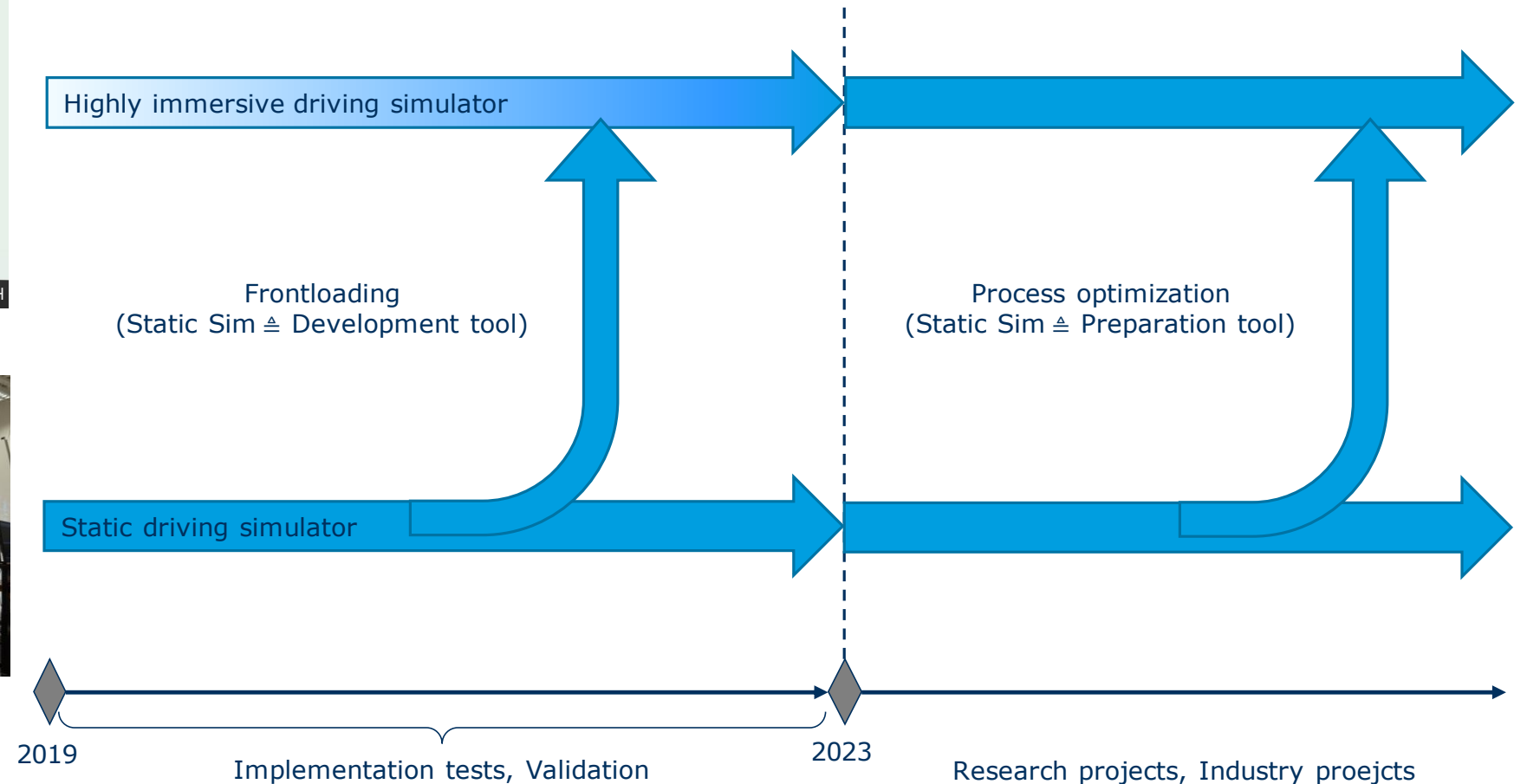
Motion platform (3 FHG*) * Active controlled	$\ddot{x}; \ddot{y} \text{ (m/s}^2\text{)} / \ddot{\psi} \text{ (}^\circ\text{/s}^2\text{)}$	9; 9 / 206
	$\dot{x}; \dot{y} \text{ (m/s)} / \dot{\psi} \text{ (}^\circ\text{/s)}$	14; 14 / 320
	$x; y \text{ (m)} / \psi \text{ (}^\circ\text{)}$	inf; inf / inf
Yaw bearing (1 DOF)	$\ddot{\psi} \text{ (}^\circ\text{/s}^2\text{)}$	180
	$\dot{\psi} \text{ (}^\circ\text{/s)}$	220
	$\psi \text{ (}^\circ\text{)}$	inf
Hexapod (6 DOF)	$\ddot{x}; \ddot{y}; \ddot{z} \text{ (m/s}^2\text{)} / \ddot{\phi}; \ddot{\theta}; \ddot{\psi} \text{ (}^\circ\text{/s}^2\text{)}$	6; 6; 9 / 300; 300; 500
	$\dot{x}; \dot{y}; \dot{z} \text{ (m/s)} / \dot{\phi}; \dot{\theta}; \dot{\psi} \text{ (}^\circ\text{/s)}$	0,45; 0,45; 0,42 / 50; 50; 45
	$x; y; z \text{ (m)} / \phi; \theta; \psi \text{ (}^\circ\text{)}$	0,15; 0,15; 0,13 / 17; 17; 15
Seat Shaker	$\ddot{z} \text{ (m/s}^2\text{)}$	10
Dimensions (m x m x m)		4,4 x 4,4 x 4,6
Mass (kg)		~ 4700
Visualization system		3 projectors



Source: AMST-Systemtechnik GmbH

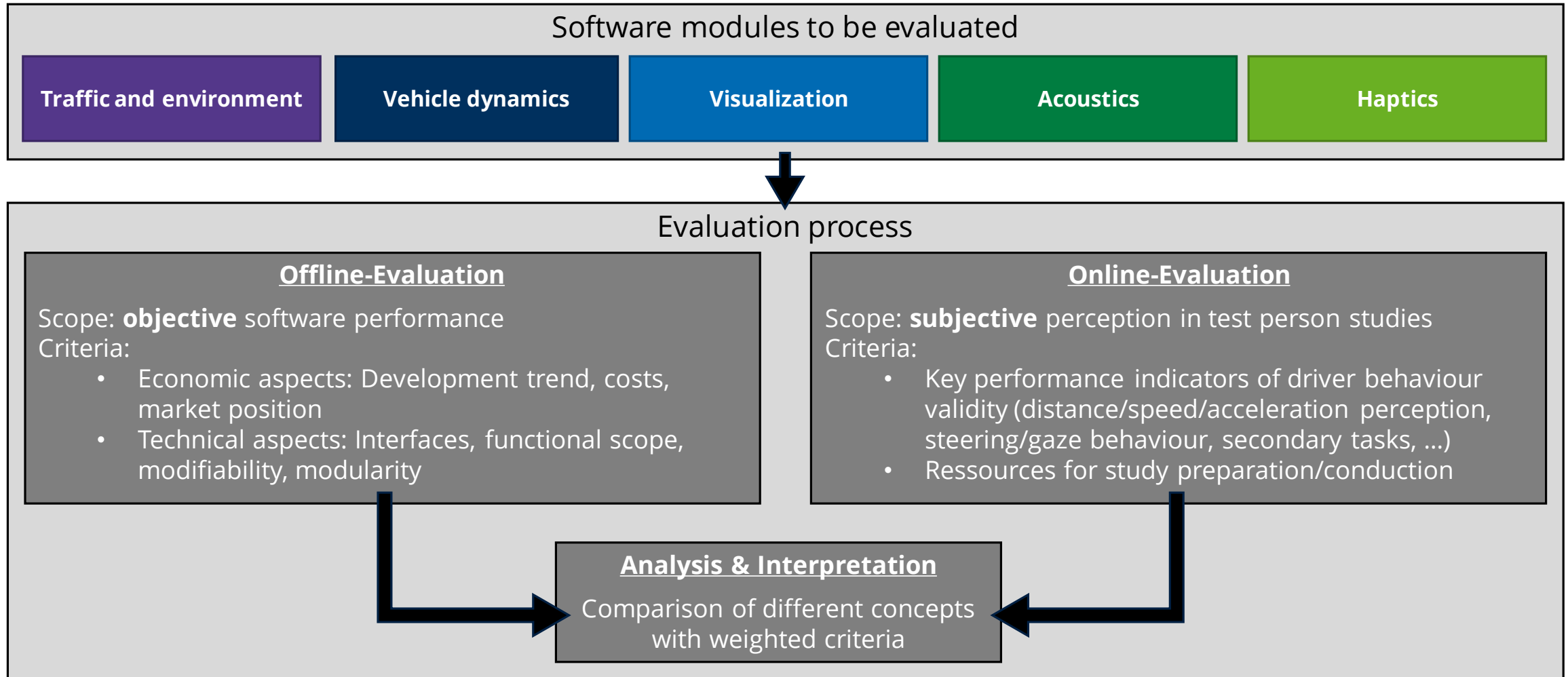
Symbioses of static & dynamic driving simulator

Frontloading, process optimization



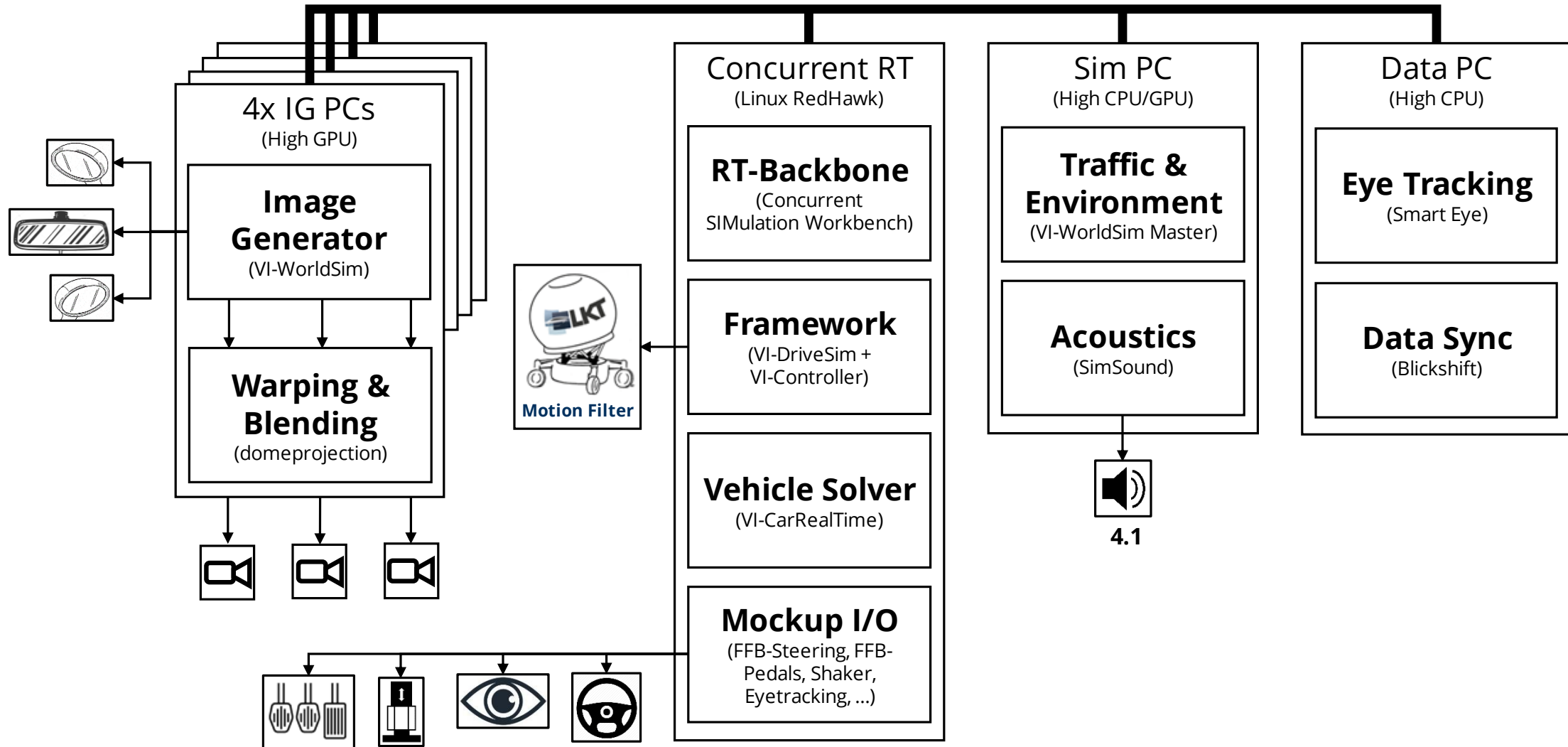
Simulation environment

Evaluation process



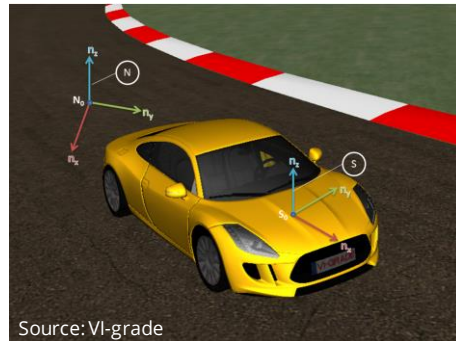
Simulation environment

Software architecture

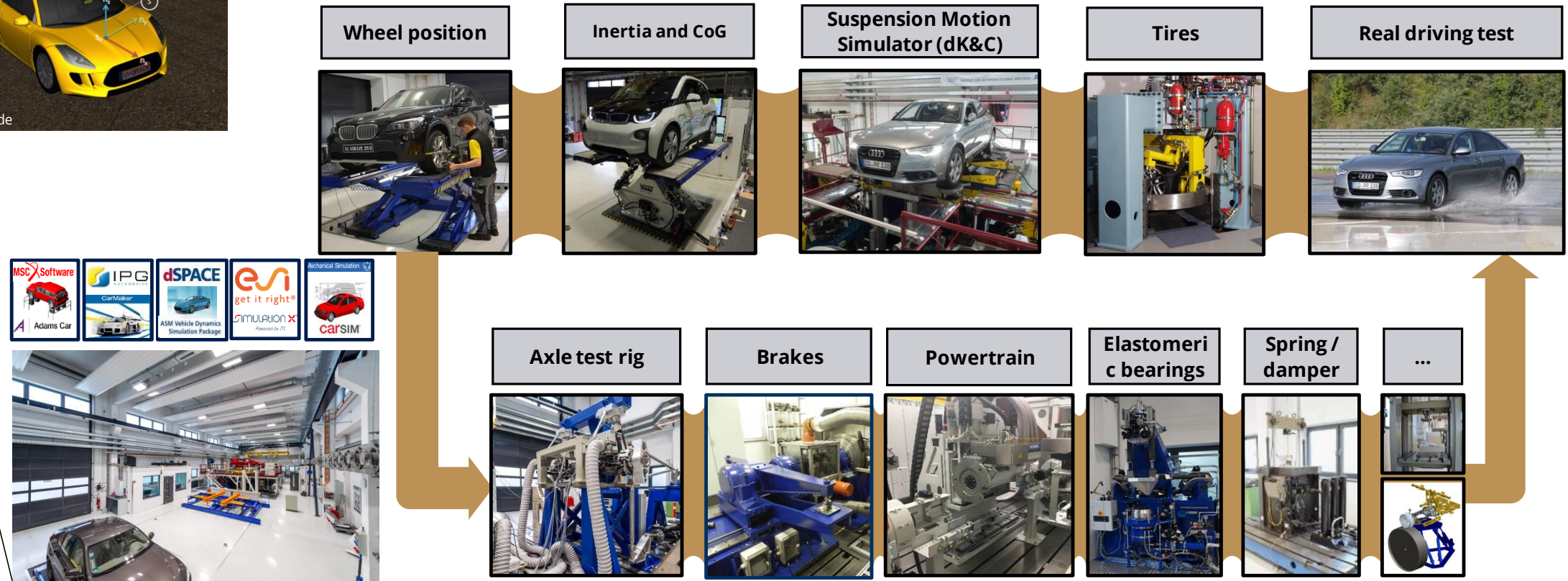


Potential use-cases

Simulation software perspective



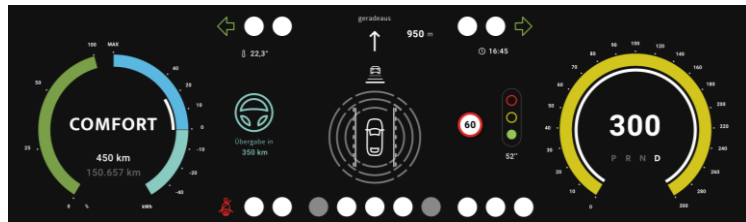
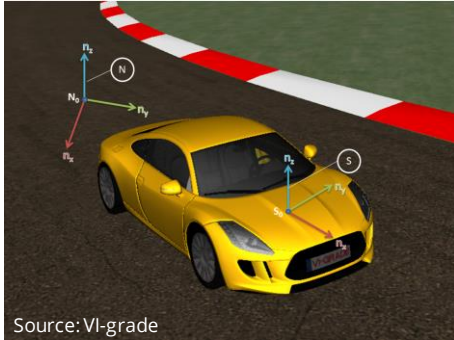
Parameter identification („Parameterization pipeline of TU Dresden“)



Source: AMFD Auto Mobil Forschung Dresden GmbH

Potential use-cases

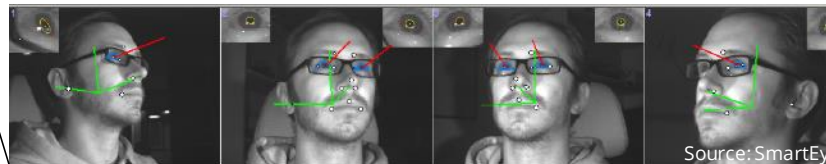
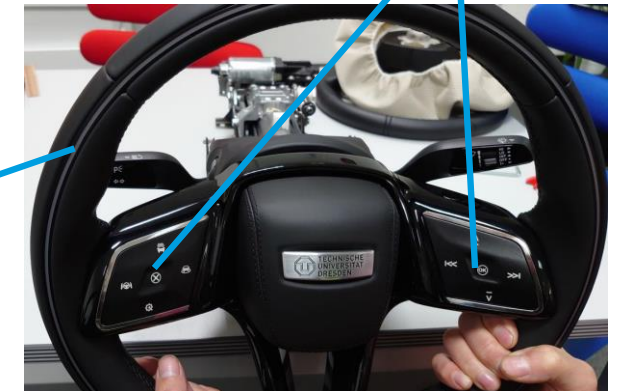
Simulation software perspective



3 free programmable displays

10 free programmable buttons

360° Lightbar & Hands-on detection

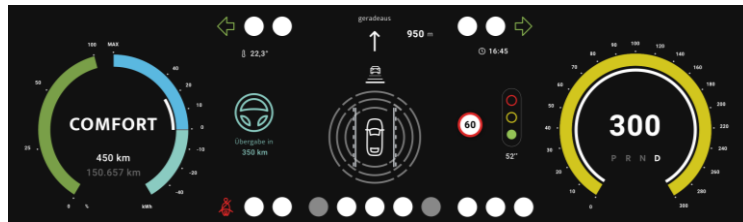
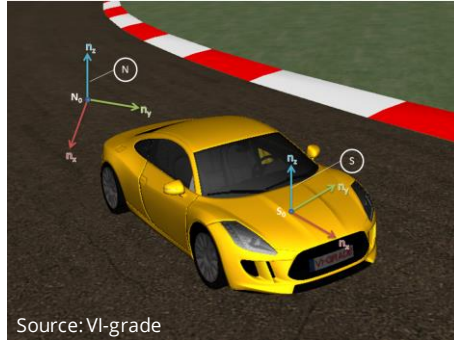


Source: SmartEye

SmartEye Eye-tracking system

Potential use-cases

Simulation software perspective



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