Proving Ground Automation and Digitization

A part of the validation tool chain for

evaluating highly automated driving functions

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Proving Ground Automation and Digitization

Past

- ‣ ENCAP driven
- ‣ Automation limited to
  - ‣ Test itself
  - ‣ Test report generation

Future

- ‣ Test integration across the entire safety testing chain
- ‣ Transferability of KPI´s
- ‣ Swarm test methods & PG test bench
- ‣ Multi vendor test environment
- ‣ Campus network with RTC quality
- ‣ Digital Twin
- ‣ Automated PG endurance tests
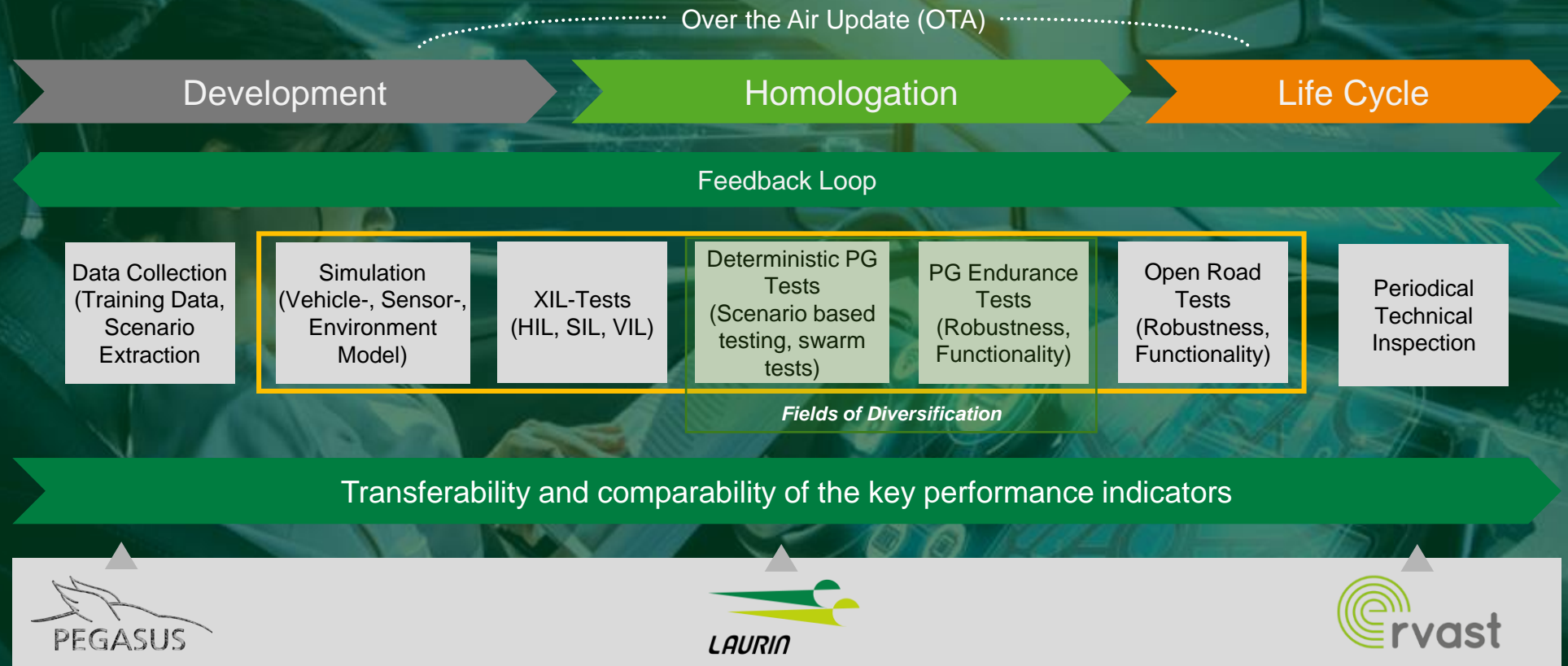
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Over the Air Update (OTA)

Development	Homologation	Life Cycle

Feedback Loop

Data Collection (Training Data, Scenario Extraction)	Simulation (Vehicle-, Sensor-, Environment Model)	XIL-Tests (HIL, SIL, VIL)	Deterministic PG Tests (Scenario based testing, swarm tests)	PG Endurance Tests (Robustness, Functionality)	Open Road Tests (Robustness, Functionality)	Periodical Technical Inspection

Fields of Diversification

Transferability and comparability of the key performance indicators

PEGASUS

LAURIN

rvast

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Scenario

Central Control Station

Mobile Control Station

Mesh W-LAN or 5G Campus Network

VMM

Robotic

Targetmover

IMU

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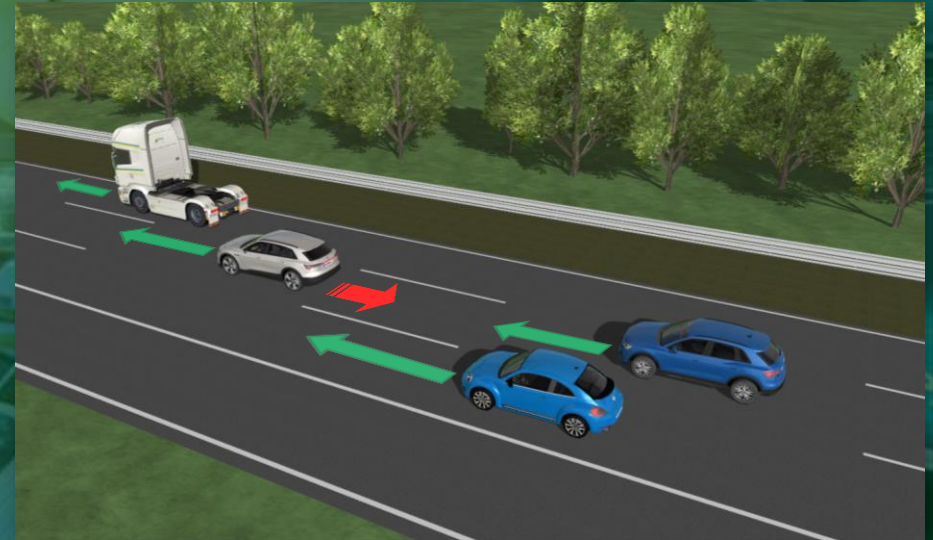Team ADAS
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‣ Real-time simulation with online transmission of the dynamic trajectories to the swarm participants on PG (CarMaker as part of the control center)

‣ Integration of virtual objects possible (mixed reality)

‣ Same scenarios in simulation and on PG
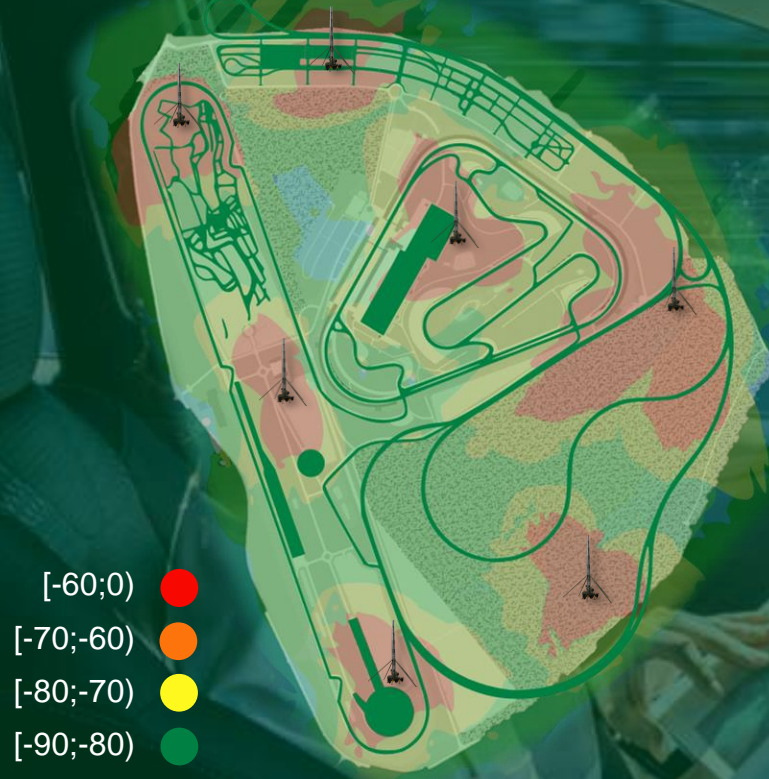
‣ Same scenario flow control / simulation environment

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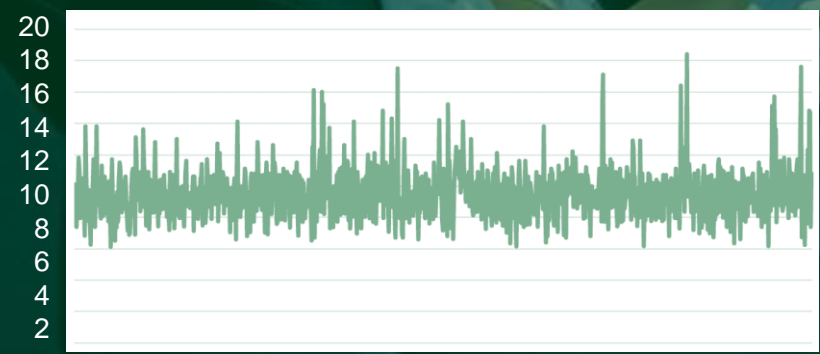# Proving Ground Automation and Digitization

5G

Vs.

Mesh

Campus

Network

[-60;0) 🔴
[-70;-60) 🟠
[-80;-70) 🟡
[-90;-80) 🟢

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Ø Latency of 10 ms

Ø Latency of 20 ms

Proving Ground Automation and Digitization

City-Course

‣ 80,000m² asphalt surfaces

(1.6 km x 0.2 km)

‣ Max. 4 lanes (4-lane intersection)

‣ Mobile building facades

‣ Autonomous Driving Level 3-5

‣ All city scenarios

‣ V2X

‣ Crossing assistant

‣ Turning assistant

‣ Stop and go traffic

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Let`s face

the challenge together

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