

Simulation-based Development and Testing of Automated Driving



Motivation



- Automated and connected driving is complicated and inherently complex
 - advanced technologies
 - wide range of functionalities
 - complex environments (e.g. urban areas) / traffic systems (e.g. an intelligent traffic infrastructure, communication technologies and backend systems)
 - large number of traffic scenarios which have to be considered
 - users and other traffic participants (in particular cyclists and pedestrians)
 - normative and non-normative behavior
- Different levels of automation and a variety of vehicle concepts must be considered
- Cooperative functions are an upcoming topic
- Environment / traffic system could be transformed ...



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Motivation

- Simulation becomes an essential tool for
 - requirements
 engineering
 and a variety of other
 other development tasks
 - assessment and test
- Heterogeneous groups of users and their diverse needs and objectives result in complex sets of requirements for simulation-based tools



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SETLevel

SET Level as part of the PEGASUS project family



 The PEGASUS Family focuses on development / testing methods and tools for AD systems on highways and in urban environments



VV-Methods

Simulation-based Development and Testing of Automated Driving

SET Level – Top goals & interdependencies





Simulation-based Development and Testing of Automated Driving

Fields of Action and selected Goals

- Provides an environment for simulation-based systems exploration and understanding as well as verification & validation as a service
- Platform with highly generic components open, flexible and extendable
 - Scenario-based approach
 - adaption and configuration for special projects with low effort
 - easy to use / "no experts needed"
 - supports a wide range of development tasks, assessment & testing
 - provides insights to support safeguarding and homologation
- OEMs, suppliers and IT vendors benefit from standards (drafts) / standardization activities initiated





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Slide 6

Towards a SET Level Methodology

Big Picture





Towards a SET Level Methodology

Core Dimensions to Consider in the Context of our Toolchain





Simulation-Based Engineering Tasks

Simulation-based Development and Testing of Automated Driving

Towards a SET Level Methodology – Link to ASAM



DRAFT – Generic Open Testing Architecture



GAIA-X 4 Future Mobility



GAIA-X 4 PLC – with a Focus on Automated Driving

 Complementary projects that are horizontally connected – "Projektfamilie GAIA-X 4 Future Mobility"



https://www.gaia-x4futuremobility.dlr.de/

Thank you for your Attention ...



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