TARGET OBJECTIVES

openPASS
(open Platform for Assessment of Safety Systems)

High level of transparency and acceptance through publicly available open source platform

Traffic simulation of highway, rural and urban scenarios

Stochastic variation of scenarios

Reproducibility through deterministic simulation

Standardized interfaces for model integration

Harmonized and flexible platform for effectiveness assessment of advanced driver assistance systems and automated driving
openPASS Working Group

Driver members:

BMW GROUP  BOSCH  Mercedes  TÜV SÜD  VOLKSWAGEN

User member:

TOYOTA  itk

Service provider:

Eclipse Automotive Working Groups

openPASS  OpenADx  openMobility  openGENESIS  openMDM
PLATFONM CONCEPT

Agent Components *
- Driver
- Vehicle
- Sensor
- Function

Standardized Interfaces

Scenario *
- Accident data
- Traffic data
- Synthetic data

* Simple examples are provided

SIMULATION CORE

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CURRENTLY AND FUTURE SUPPORTED STANDARDS

OpenSCENARIO®
bringing content to the road

OSI
Open Simulation Interface

OpenDRIVE®
managing the road ahead

fmi
FUNCTIONAL MOCK-UP INTERFACE

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PLATFOR M STRUC TURE

User-Specific Plugins *

Platform Delivered Plugins

Simulation Components

Exemplary Agent Components

User-Specific Agent Components *

Component Interfaces

GUI (Plugin Manager)

Simulation Core

openPASS Platform

* Implemented by the user
PLATFORM STRUCTURE

openPASS Platform

GUI (Plugin Manager)

Component Interfaces

Simulation Core

User-Specific Plugins *

Platform Delivered Plugins

Component Interfaces

Simulation Core

User-Specific Agent Components *

Exemplary Agent Components

Dynamics

Sensors

Manipulators

World State

Observer

Detectors

Spawner

Simulation Components

User-Specific Plugins *

Platform Delivered Plugins

Component Interfaces

Simulation Core

openPASS Platform

* Implemented by the user

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Simulation Process

Configuration through GUI

Configuration files

Simulation execution

Output files

Evaluation in GUI
Features:
- Closed loop simulation of traffic scenarios
- Stochastic variation of the scenarios
- Intervention through detection of events and triggered actions
- Faster-than-real-time execution of the simulation

Example: AEB intervention triggered by passive cut-in manoeuvre
- Highway scenario with random surrounding traffic
- Ego vehicle with simple AEB system and abstract sensors
- Time-based event trigger
- Trajectory controlled lane change for scenario vehicle
Features:

▪ Create configuration files from GIDAS-PCM accident scenario database
▪ Stochastic variation of the scenarios (positions, velocities)
▪ Basis components for re-simulation: sensor, trajectory follower, two track vehicle model, impact calculation
▪ Store results in csv files in case folders

Example question: How many selected cases could be avoided by a AEB function?
EXEMPLARY SIMULATION RESULTS

Traffic-scenario simulation
AEB intervention triggered by passive cut-in manoeuvre

Crash re-simulation from GIDAS-PCM case
Oncoming collision at intersection (LTAP – “left turn across path”) with post-crash behaviour
Eclipse Working Group **openPASS** (idea for openPASS generated within P.E.A.R.S. in 2014)

**TIMELINE**

- **08/2016** Foundation of openPASS
- **01/2018** New driver member
- **06/2018** New user member
- **11/2018** New driver member

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openPASS is an open source platform for effectiveness assessment of advanced driver assistance systems and automated driving

- Open source platform for high level of acceptance and transparency
- Modular structure for easy platform extension and inclusion of user-specific models
- Support for standards and standardized interfaces for a flexible simulation setup
- Exemplary applications of openPASS:
  - Crash re-simulation
  - Traffic-scenario simulation
PARTICIPATION IN THE WORKING GROUP

The company should be at least an Eclipse Solution Member
- Networking and learning
- The annual membership fee for Solutions Members is tiered based on revenue

Working Group participation agreement
- Contribution in development of openPASS
- Discussion of the roadmap
- Active collaboration with the working group

For more information, look at the openPASS charter:
https://www.eclipse.org/org/workinggroups/openpasswg_charter.php
COMMUNICATION WITH THE WORKING GROUP

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