ASAM OpenSCENARIO 1.0.0

Release Presentation

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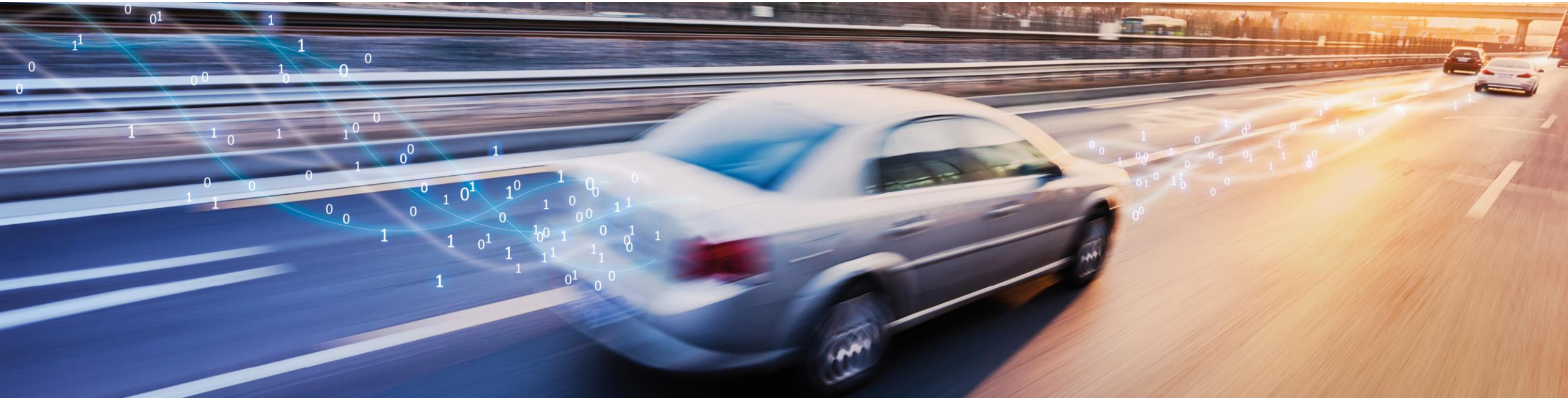

ASAM Association for Standardization of Automation and Measuring Systems

Agenda

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Introduction

OpenSCENARIO is used in driving simulation and in virtual development, test and validation of driving assistance functions, automated and autonomous driving.

Within these use cases, OpenSCENARIO describes the dynamic content of the world, i.e. the entities acting on or interacting with the road network. OpenSCENARIO does not describe the road network, road infrastructure or road surface.

OpenSCENARIO was transferred to ASAM by an industry consortium in late 2018. It evolved to the ASAM standard OpenSCENARIO 1.0.0 within the ASAM OpenSCENARIO Transfer project.

Motivation

Scenarios are essential for testing, validating and certifying the safety of driver assistance systems and autonomous driving cars. The industry, certification agencies and government authorities jointly work on the definition of scenario databases, which can be used to test and validate the safe operation of such systems.

OpenSCENARIO supports this endeavor by enabling the exchange and usability of scenarios in various simulation applications. With the help of this standardization effort, large numbers of critical situations can be run across various simulators. Thus, compared to road testing in real traffic, the amount of driven test kilometers in field tests can be significantly reduced.

The overall goal of ASAM OpenSCENARIO 1.0.0 was to create a standardized scenario description format which provides a quality- and completeness-level that is expected from a public standard and from ASAM members.

New Features

Creation of a Data Model and Derived Schema Files

- UML Data Model
- XML Schema Files

Creation of Specification Documents

- Specification Programmers Reference Guide
- Specification User Guide

Creation of Comprehensive Examples, Evaluation of Deficits and Potential Improvements

- 9 Examples
- 44 Bugzilla Items

Other Changes

Clarification and Technical Improvement

- Coordinate Systems
- Storyboarding and StoryboardElements (state machine, transitions and runtime behavior)
- Parameters and Catalogs
- Triggers, Conditions and ConditionEdges
- TrafficActions
  - TrafficSinkAction
  - TrafficSourceAction
  - TrafficSwarmAction
- RoutingActions
  - AssignRouteAction
  - FollowTrajectoryAction
  - FollowRouteAction
- SynchronizeAction
- Routes and Trajectories
- …

Backward Compatibility

ASAM OpenSCENARIO 1.0.0 and the predecessor version 0.9.1 differ in terms of semantics, naming and structure. As consequence, version 1.0.0 cannot provide backward compatibility to version 0.9.1.

Instead, OpenSCENARIO 1.0.0 provides an XSLT migration script to transform valid files of the earlier version 0.9.1 into valid OpenSCENARIO 1.0.0 files. Within this script, each element of the 0.9.1 version has a template that transforms and reshapes the element to OpenSCENARIO 1.0.0.

Relation to Other Standards

ASAM OpenDRIVE

In order to use semantic road network information within ASAM OpenSCENARIO, the road network description ASAM OpenDRIVE can be referenced.

ASAM OpenCRG

Road surface profiles defined by OpenCRG can be referenced from the before mentioned OpenDRIVE road network description and thus complement the two other standards.

Deliverables

Documents

- Specification Programmers Reference Guide
- Specification User Guide

Data Model and Supplementary Files

- UML Data Model
- UML Modeling Rules
- HTML Documentation
- XML Schema File
- Examples
- Migration Script (0.9.1 –> 1.0.0)
- List of Analyzed Deficits and Proposed Improvements

Outlook

A proposal for a follow-up “ASAM OpenSCENARIO 1.x” project was written and will be presented to the ASAM TSC. This project is intended to further develop the ASAM standard OpenSCENARIO 1.0.0.

Goals of the proposed project incorporate

- Completion of tasks that could not be completed within ASAM OpenSCENARIO 1.0.0
- Provision of support for users and implementers of OpenSCENARIO 1.0.0 and 1.x
- Close collaboration with a proposed ASAM OpenSCENARIO 2.0 project. Result of this cooperation shall include an explicit migration path for ASAM OpenSCENARIO 1.x scenarios

Number of open CRs:

Error	0
Clarification	6
Feature	23
Improvement	15
Indetermined	0