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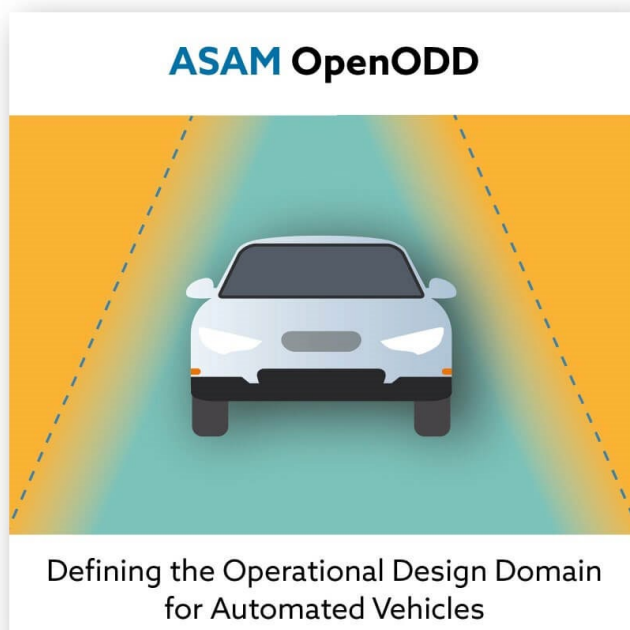
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Press Release

ASAM publishes concept for a new Autonomous Vehicle Safety Standard enabling testing for road readiness

An Operational Design Domain (ODD) is fundamental to the safety of Connected Autonomous Vehicles (CAV). It describes the specific operating conditions in which the CAV is designed to operate safely. ASAM has now published the concept for a future standard to define ODDs: “ASAM OpenODD” shall specify a language concept as well as a machine-readable format to allow users to share, compare and re-use ODD definitions. Among other things, this will clear barriers between CAV manufacturers and authorities to determine whether a CAV is allowed to drive within the authority’s area. The concept

paper can be downloaded free of charge. Additional use cases or requirements can still be proposed before the standard development starts.



Hoehenkirchen, Germany

(February 01, 2022) – Safety is fundamental to the development of connected and automated vehicles (CAV) and to the realization of automated driving (AD). This implies we need a rigorous

validation process for AD functions. In addition, it is important to define the operating conditions in which the vehicle can be deployed safely. This safe operating space is defined in the Operational Design Domain (ODD). An ODD defines parameters such as road type, weather conditions, traffic conditions, time of day, and many others under which CAVs are designed to drive safely. The ODD is thus an important part of the safety concept of a vehicle and must be valid throughout its entire service life for a particular configuration of the AD function.

For the automotive manufacturer, the ODD is important because it determines which scenarios a CAV is exposed to and thus against which scenarios a driving function or the CAV must be validated. The ODD therefore helps to focus the limited validation resources on the scenarios that are really needed and relevant. For example, if the ODD excludes a driving speed above 50 km/h and driving on highways, vehicle manufacturers can adapt their catalog of test scenarios accordingly and neglect higher speed highway tests.

An ODD definition is particularly important for simulation-based testing. Standards are needed to enable stakeholders to share, compare and re-use ODD definitions. This is where ASAM OpenODD comes into play: the standard will provide a machine-readable format capable of representing a defined ODD for testing in simulations and other machine-processing environments. In addition, the format shall be searchable, interchangeable, extensible, verifiable, and human readable thus making it usable for all other post-processing steps. This way, ASAM OpenODD will help to ensure that ADAS and autonomous driving systems can be developed not only safely, but also quickly, efficiently and reliably.

An application example of the effective use of ASAM OpenODD is as follows: A city authority describes the ODD for its downtown area in the ASAM OpenODD format and makes it available to automotive manufacturers. The manufacturers can then use these descriptions to easily match their vehicles with the defined ODD to find out if their vehicles are allowed to drive in the respective downtown area. They can also use the descriptions to map their scenario test catalogue to the requirements of the

ODD. The regulatory authorities have the benefit of checking ODDs that they can use to approve autonomous vehicles.

Dr. Siddhartha Khastgir, from WMG, University of Warwick, and leader of the ASAM OpenODD concept group comments: "Operational Design Domain definition is key to creating a safe automated vehicle. However, how an ODD is defined hasn't been officially deemed, until now, as the ASAM OpenODD concept has provided the language to define an ODD. This means that going forward, CAV manufacturers can define and exchange ODD definitions and authorities can have a common understanding of the ODD definition. I am grateful to all international experts who have contributed to this work. Achieving safety of automated driving needs to be a collaborative effort and ASAM OpenODD is an example of this."

"ASAM OpenODD will be a standard that will not only contribute to the safety of automated vehicles, but more importantly, will help to implement automated driving functions faster," says Peter Voss, Managing Director of ASAM e.V.

In addition to the format and syntax, the concept for ASAM OpenODD also takes into account attributes (leveraging ISO 34503), metrics and the representation of uncertainties. The future standard will be compatible with all other standards of the ASAM OpenX family, particularly with OpenDRIVE, OpenSCENARIO and OpenXOntology.

The ASAM OpenODD initiative takes into account and complements ongoing international standardization activities of BSI (BSI PAS 1883 provides a taxonomy for ODD) and ISO (ISO 34503 uses the taxonomy to provide a high-level definition format for ODD for use by regulators, system engineers, local authorities etc). All three projects are in close contact.

So far, only the concept of ASAM OpenODD has been published. The working group to develop the standard will start in March / April 2022. Potential users of a future standard are specialists for development, simulation, test processes, security, data analysis, scenario editors and data labeling as well as infrastructure operators.

ASAM e.V.

ASAM e.V. (Association for Standardization of Automation and Measuring Systems) is actively promoting standardization within the Automotive Industry. Together with its currently more than 370 member organizations worldwide, the association develops standards in the area of automotive electronic engineering that define interfaces and data models for tools used for the development and testing of electronic control units (ECUs) and for the validation of the total vehicle. ASAM is the legal representative of 35 standards that are applied in the automotive industry worldwide.

(www.asam.net)

WMG, University of Warwick

WMG is a world leading research and education group, transforming organisations and driving innovation through a unique combination of collaborative research and development, and pioneering education programmes. As an international role model for successful partnerships between academia and the private and public sectors, WMG develops advancements nationally and globally, in applied science, technology and engineering, to deliver real impact to economic growth, society and the environment. WMG's education programmes focus on lifelong learning of the brightest talent, from the WMG Academies for Young Engineers, degree apprenticeships, undergraduate and postgraduate, through to professional programmes. An academic department of the University of Warwick, and a centre for the HVM Catapult, WMG was founded by the late Professor Lord Kumar Bhattacharyya in 1980 to help reinvigorate UK manufacturing and improve competitiveness through innovation and skills development.

(<https://warwick.ac.uk/fac/sci/wmg/>)

Important Links

- ASAM OpenODD Concept: <https://www.asam.net/standards/detail/openodd/>
- Recording of webinar: <https://www.asam.net/conferences-events/detail/webinar-asam-openodd-concept/>

Further resources on understanding ODDs:

- What is an ODD (Tutorial by Nicco Hagedorn, ASAM e.V.):
<https://www.youtube.com/watch?v=u4F5OZIRIaQ>
- The Curious Case of Operational Design Domain: What it is and is not?
(Blog by Siddartha Khastgir, WMG): <https://bit.ly/CuriousCaseODD>