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Passenger cars — Simulation model classification —

Part 2: Perception sensor models for ADAS/AD

Voitures particulières — Classification des modèles de simulation —

Partie 2: Modèles de capteurs de perception pour ADAS/AD

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Foreword

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This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 33, *Vehicle dynamics, chassis components and driving automation systems testing*.

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Introduction

This document was developed in response to worldwide demand for standardization of simulation models and their requirements in specific scenarios as use cases. During development and test of road vehicles, the question arises of how good simulation models have to be for performing certain use cases. Without standardization, it is common practice that experts in different organizations develop their own methods and processes to answer this question. When it comes to comparability and model exchange between project partners, obstacles occur.

The main purpose of this document is to provide a framework that enables a systematic characterization of perception sensor simulation models. This document does not consider specific sensor effects for classification. The simulation models are classified into certain model classes, their designation number and related elements, characteristics and common modelling methods. The assignment is the responsibility of the user or can be specified by other regulations and standards.

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Passenger cars — Simulation model classification —

Part 2: Perception sensor models for ADAS/AD

1 Scope

This document specifies a classification framework and terminology of simulation models for perception sensors in advanced driver assistance systems and automated driving (ADAS/AD) use cases. It builds upon the overall framework defined in ISO 11010-1 [1], which is applicable to vehicle dynamic models.

This document focuses on perception sensor models for radar, camera, lidar and ultrasonic sensors.

This document enables a structured approach for perception sensor model selection and provides a foundation for consistent sensor model comparison. The model classification is based on the modelling approach of the sensor model and its environment, as well as the necessary inputs and outputs of the model.

2 Normative references

There are no normative references in this document.

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3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
simulation model
mathematical model for the calculation of the system state variables based on equations describing a vehicle or vehicle sub-system

[SOURCE: ISO 11010-1:2022 [2], 3.1, modified — Note 1 to entry has been deleted.]

3.2
model class
category of *simulation models* (3.1) of a vehicle or a vehicle sub-system

EXAMPLE Radar perception sensor model class.

3.3
model subclass
subclassification of a *model class* (3.2), including the separation of sensor physical system model and controller model parts of the overall model class into individual subclasses

EXAMPLE Radar perception sensor physical system model subclass.

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