Topic Preview ATZ Issue 01.2025

COVER STORY | AUTOMATED DRIVING

Connected driving functions for highly automated driving
The EU-funded HiDrive project is investigating the technical and situational limitations of automated vehicles. The 40 partners involved are developing and evaluating solutions. The work of FEV.io is concentrating on tests relating to motorway access.

Validated traffic models for virtual test driving
Traffic models are of fundamental importance for the validation and certification of automated driving functions by means of virtual test driving. This way, a large part of the tests that are still conducted in real test driving today can be transferred to the virtual world with time and cost advantages. IPG Automotive and cogniBIT explain the validation process and the benefits of using human behavioral models.

Interview: "The real test will certainly not become obsolete anytime soon"
ATZ discusses with the Executive Director Digitalization and Softwares, Sören Müller, Segula Technologies, the effects of increasing automation in automotive technology and the complex challenges in the field of testing, simulation and validation.

GUEST COMMENTARY

Stefan Bruhnke, AVL

Dates

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DEVELOPMENT | METHODS | PROCESSES

Metamorphic testing – a test method for validation of deep-learning-based object detection systems
Complex tasks, such as environment perception in autonomous driving, are increasingly being taken over by systems based on deep neural networks. Testing such systems requires various investigations to ensure sufficient validation in series development. IAV and TU Munich have applied Metamorphic Testing, a validation method that does not require ground-truth information, to lidar systems and tested this for use in object detection functions.

Transfer stiffness characterization of elastomer mounts in the high-frequency range
The dynamic transmission behavior of aggregate mounts has a greater effect on the acoustics in the interior when the vehicle is electrically powered. In this context, the metrological characterization of mount prototypes is of great importance within the development process. The Fraunhofer IWU and m+p present a collaborative study in which two measurement methods for mount characterization are compared and evaluated.

INTERIOR

Automated driving – a field test to interior and user experience
In the decision to purchase a passenger car, the user experience is becoming increasingly important. As part of the Rumba research project, the Hochschule der Medien Stuttgart University of Applied Sciences is developing an innovative interior for SAE-L4 highly automated driving. An experimental field test is being conducted to evaluate its added value compared to a classic interior in terms of its effects on social interaction.

MOBILITY CONCEPTS

Generative AI in the data lifecycle of autonomous driving
Self-driving vehicles are one of the most significant technical challenges in the automotive industry, especially from the perspective of data-driven software development. ITK presents how generative AI can be used in data-driven software processes such as the Big Loop in order to utilize data from large vehicle fleets for software and algorithm development more efficiently.

ARTIFICIAL INTELLIGENCE

Use of AI methods with large language models in requirements and test engineering
Methods that are based on Artificial intelligence (AI), in particular those known as Large Language Models (LLMs), offer considerable potential for increasing efficiency in the engineering process. Bosch Engineering shows the benefits of LLM applications in the area of requirements and test development.

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Automated and bidirectional charging of BEVs
Fast charging on the highway for long distances, automated charging with low power in everyday life – this is what a viable charging concept could look like, one that reduces the risk of overburdening the power grid and supports the security of supply. Developments for automated and bidirectional BEV charging are shown here that can be used to technically implement this vision.

RESEARCH | VEHICLE ELECTRICAL SYSTEM

Paradigm Shift for Automotive Wiring Harnesses – Reshoring of Production Processes
In response to increasing insecurity in global supply chains, the automotive industry is re-evaluating its strategies, with previously outsourced production processes such as wire harness manufacturing being brought back in-house. To offset higher costs, the value chain from harness development and production to assembly at the OEM needs to be highly automated. In the Next2OEM project, a consortium of companies from the wiring harness industry, including Audi and the University Erlangen-Nuremberg (FAU), is therefore researching concrete approaches to significantly increase the level of automation.