

Deepen AI and AVL Join Forces to Enhance Data Accuracy for ADAS and AD Systems

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Automated vehicles are changing the nature of transportation and rely heavily on high-quality data to accurately perceive their environment. The Ground Truth Reference System from [AVL](#), one of the world's leading mobility technology companies for the development, simulation, and

testing in the automotive industry and other sectors, enables efficient and reliable development and validation of vehicle perception sensor technology. It leverages the sensor calibration suite [Deepen Calibrate](#), from the start-up [Deepen AI](#), to enable precise sensor calibration during driving campaigns and accurate ground truth data collection.

The higher the degree of automation (SAE Level 0 to 5) of a vehicle, the more software-controlled sensor systems take over the detection of the environment and respond to it. Perception of the environment is both a crucial and a challenging task for Advanced Driver Assistant Systems

(ADAS) and Autonomous Driving (AD). A wide range of sensors, including LiDAR, cameras and radars are used to build the perception layer of these systems and ensure a precise view of the surroundings in diverse traffic and environmental situations.

The development and validation of vehicle perception sensor technology is based on the objective comparison of the vehicle's sensor signals against an independent, highly precise reference data set generated from real-world test driving – so-called ground truth. The closer the vehicle's perception is to ground truth, the more accurate the picture of its surroundings will be – an important prerequisite for the vehicle to act in a safe manner.

As a strong partner in ADAS/AD engineering and testing, AVL has developed the AVL Ground Truth Reference System™ (DGT). Mounted on a vehicle, it captures a holistic 360° field of view of the vehicle's static and dynamic surroundings. The DGT recorded ground truth data consists of lidar, camera, and high-precision GPS sensors, offering an extremely accurate view of the vehicle and its systems' test environments. This enables engineers to make statistical analysis of large amounts of representative, accurate real-world driving data to assess the performance of the ADAS/AD sensors and their perception algorithms.

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By combining our efforts through Deepen Calibrate and AVL's cutting-edge Dynamic Ground Truth™ solution, we can significantly increase the quality of data and increase the safety of ADAS/AD systems”

Mohammad Musa, CEO and Co-Founder at Deepen AI

There is one important aspect engineers must pay attention to when it comes to ground truth data collection: If sensors are not well calibrated, then data collected during a driving campaign is less accurate. That impacts the quality of the ground truth data which on the other hand might lead to unreliable and unsafe development and validation of the vehicle's sensor and perception system.

"Independent, high-precision ground truth reference systems such as AVL DGT play an increasingly critical role for our OEMs to objectively develop and validate their vehicles sensor performance. With Deepen Calibrate, we can ensure that our AVL DGT-sensors are calibrated with high accuracy in a fraction of time during driving campaigns", said Thomas Guntschnig, Portfolio Manager ADAS/AD Testing Solutions at AVL.

To ensure data accuracy, AVL is partnering with the Silicon Valley-based start-up Deepen AI. Deepen Calibrate makes the critical task of sensor calibration simple and quick. It cuts the time spent on calibrating multi-sensor data from hours to minutes and can be utilized for LiDAR, radar, camera and IMU (Inertial Measurement Unit) and more.

"Reliable data is the foundation for safety. By combining our efforts at Deepen AI through Deepen Calibrate and AVL's cutting-edge AVL Dynamic Ground Truth™ solution, we can significantly increase the quality of data and increase the safety of ADAS/AD systems," said Mohammad Musa, CEO & Co-founder of Deepen AI.

About Deepen AI

Deepen AI is a Silicon Valley-based start-up and the only safety-first data lifecycle tools and services company. Deepen AI builds multi-sensor data labelling and calibration tools to accelerate computer vision training for autonomous vehicles, robotics and more. With tools and services that are customizable to suit the needs of enterprises as well as start-ups, they have happy customers of every size across the globe.

For more information: www.deepen.ai

About AVL

With more than 10,700 employees, AVL is one of the world's leading mobility technology companies for development, simulation and testing in the automotive industry, and beyond. Drawing on its pioneering spirit, the company provides concepts, solutions and methodologies for a greener, safer and better world of mobility.

From ideation phase to serial production, the company covers vehicle architectures and platform solutions including the impact of new propulsion systems and energy carriers. As a global technology provider, AVL's offerings range from simulation, virtualization and test automation for product development to ADAS/AD and vehicle software. The company combines state-of-the-art

and highly scalable IT, software and technology solutions with its application know-how, thereby offering customers extensive tools in areas such as Big Data, Artificial Intelligence, Cybersecurity or Embedded Systems.

AVL's passion is innovation. Together with an international network of experts at more than 90 locations and with 45 Tech and Engineering Centers worldwide, AVL is supporting customers in their mobility ambitions. In 2021, the company generated a turnover of 1.6 billion Euros, of which 12 % are invested in R&D activities to ensure continuous innovation.

For more information: www.avl.com

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