Media Information

Volkswagen

September 24, 2018

Volkswagen to use virtual test drives to make new assistance systems production-ready

→ Brand expects faster and more efficient development
processes through virtual validation
→ Volkswagen experts develop software for simulated
environments and driving situations
→ In the long term, test kilometers for validating automated
driving could also be completed virtually

Wolfsburg – In future, Volkswagen intends to make new driver assistance systems production-ready even faster, also using virtual validation. The assistance systems of the next generation will then learn from virtually generated driving and traffic situations. The brand expects this approach to make development processes even faster and more efficient. In the long term, it is conceivable that millions of test kilometers required for validating automated driving could be completed in virtual environments. Experts from Volkswagen are already testing software developed in-house to simulate such driving in traffic situations. This software is to be used for teaching assistance systems for the I.D. model family.

"We are continually developing Volkswagen vehicles and taking innovations into all segments," says Board Member for Development Dr. Frank Welsch. "We are building on our strong global development team and grasping all the opportunities offered by digitalization. This also includes virtual validation. We are developing this technology for our work as it will make for faster and more efficient development processes."

Systems learn faster and hardware tests are reduced
Volkswagen is aiming for two main benefits with virtual validation. Firstly, assistance systems can be trained continuously over days and weeks in any scenario desired; this approach dramatically accelerates the learning speed of the systems concerned.

With virtual validation, Volkswagen also expects to be able to develop a rapidly growing number of systems and networked vehicle functions to production maturity. To date, assistance systems have been tested using a hardware-based approach by connecting components to test rigs via data interfaces. As the number of networked functions grows, this means more and more hardware-based tests are necessary. Virtual validation will

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reduce the volume required, as physical test rigs will no longer be essential.

Volkswagen experts develop high-performance simulation platform
High-performance software is essential for the simulation of complex environments. This software ("SimFAS") is being developed by experts from Group IT and Technical Development working together. In the long term, they want to be able to generate any virtual traffic and driving situation which may be required.

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A new assistance system will then be connected to these virtual scenarios. Its sensors will process the virtual ambient data in the same way as actual ambient conditions. The software will also visualize the virtual scenario via a 3-D graphic environment. The engineers will then be able to observe the behavior of assistance systems precisely and to intervene and optimize the systems as required.

The experts from Volkswagen also want to link this simulation platform to the Group IT cloud in order to benefit from its enormous computing capacity. Hundreds of driving situations could then be learned by the same assistance system in parallel. In addition, the experts would be able to build up a virtual library of traffic situations which could be stored as successful learning examples and transferred directly to all new assistance systems.

First application: virtual car park pilot simulates thousands of car parks
Volkswagen is already testing the software which has been developed in-house. The first application simulates thousands of individual car parks with freely definable parameters (architecture, lane guidance, traffic, etc.). Car parks are regarded as an ideal example of complex environments which must be mastered by an assistance system. This virtual car park pilot is already being used for validating the assistance systems that will feature on the I.D. model family.

Virtual validation also conceivable for automated driving
In the long term, it is conceivable that millions of test kilometers required for validating automated driving could be completed in virtual

environments. The self-learning systems of the vehicle ("artificial intelligence") would process these data in the same way as data from physical tests on proving grounds and public roads. This would further accelerate the development of production-ready automated driving functions.

Volkswagen emphasizes digitalization in product development
Volkswagen is increasingly emphasizing the possibilities of digitalization in product development. In addition to virtual validation, the brand is also relocating design and development decisions to the virtual area. By adopting this approach, the brand expects to achieve efficiency savings, to accelerate decision-making processes and to ensure easier cooperation between the teams involved.

Among other approaches, Volkswagen engineers are also working with the "virtual concept car", a virtual vehicle model that allows them to fully experience and interact with the exterior, interior and functions of instruments and multimedia systems as well as modifying them. This virtual model means that the number of costly physical prototypes can be reduced.

The digital solutions are being developed by the Group IT Virtual Engineering Lab. At the lab, IT specialists launch new tools together with the Technical Development department of the Volkswagen brand. At the SimLAB , Technical Development focuses its expertise on the assessment of new applications and the management of current projects.