

DSC Europe 2023 VR – A whole new World of Simulation to discover at the intense and inspiring Driving Simulation Conference

DSC 2023 marked yet another highlight in DSC's history and has surely bolstered its position as Europe's most important conference featuring Virtual Reality (VR) and its key role in developing tomorrow's mobility.

The annual conference and exhibition have long become a firmly established event in engineers' and OEMs' calendars. DSC is organized by the Driving Simulation Association, Renault, French and German Universities and takes place in cooperation with ASAM, the German testing standardization organization. The 22nd version, yet again, gave experts and budding engineers the chance of deep diving into their respective areas of research, cherishing lively discussions and presenting or marketing their expertise.

In the limelight were crucial issues for tomorrow's mobility, such as introducing autonomous vehicles to everyday road traffic. In the beautiful surroundings of Antibes key issues ranged from road safety to how to use free time without stress, that is when the vehicle occupants enjoy the self-driving mode of autonomous vehicles.

Paving the Way for Tomorrow's Mobility

For the validation of autonomous vehicles billions of kilometers must be tested in order to offer enhanced safety compared to today's standards. The only way is simulation, for which the necessary new standards and software solutions are still being developed and in a state of early deployment with the car manufacturers.

The conference has shown, through a special session dedicated to ADAS (Advanced Driver Assistance Systems) and AD (Automated Driving) validation and homologation, that the challenges of ADS (Automated Driving Systems) are too complex to be handled without cooperation between European OEMs and Tier 1 suppliers.

It is, therefore, more important than ever, indeed mandatory to bring together all partners and stakeholder along the automotive value chain. Only then can the present bottleneck be overcome. **Getting all partners on the same page enables effective and efficient validation, which is one key aspect of the subsequent homologation.** In particular, the successful integration of new partners, for example cities, insurance companies, cloud providers, and others, is required to take the next step. This was emphasized by many of the speakers who also voted for an active exchange of data despite the fierce competition of each single OEM. Without constructive cooperation, Europe runs a high risk of lagging behind.

Cooperation and Competition

Common standards play a crucial role here, as they foster a common understanding among all partners, establishing consistent, universally understood, and accepted boundary conditions and interfaces. *"It was a great pleasure to organize a special*

session with the entire automotive value chain and several research projects on board, with a view to discussing the current status, priorities, white spots and gaps when it comes to validation, homologation and the deployment of ADS-equipped vehicles on European roads," said Dr. Georg Stettinger, Senior European Project Coordinator at Infineon.

DSC, furthermore, managed to assemble the major software companies providing ADAS/AD validation and verification tools, aiMotive, recently bought by Stellantis, AV Simulation, a Joint Venture of Dassault Systèmes, Renault and UTAC, dSpace, IPG, MathWorks and many others, including Applied Intuition, valued at more than a billion dollars. All are applying scenario standards, issued by ASAM, Association for Standardization of Automation and Measuring Systems, namely OpenScenario 1 and 2, which are also recognized by the Chinese, Japanese and US homologation bodies. *"ASAM standards play an important role in the homologation of automated driving functions. Standardized data models and file formats make it possible to describe environments and scenarios for use in cyber-physical applications in a uniform manner and to exchange and reuse data efficiently. ASAM standards thus form the basis for certified approval processes and, in collaboration with other organizations, help to further advance the homologation of vehicles and autonomous systems"*, said Mr. Marius Dupuis, CEO of ASAM.

However, on top of this, the concrete scenario libraries are also necessary, if certified AD systems are to be achieved. The French ADScene consortium, driven by Renault and Stellantis, and the UK driven SafetyPool initiative seem to be in a good position to provide European validation and certification tools and standard scenario sets for tomorrow's autonomous vehicles.

ADScene as a significant Player

ADScene initiative was proud to conclude DSC Europe 2023 conference by organizing a workshop on ADScene tools which help to manage scenarios, use cases, and test cases. The presenting team included academics and industrial representatives from the automotive sector who explained their specific contributions to the platform, from initial research (conducted by Vedecom and SystemX research institutes), to industrialization (by Capgemini as IS/IT partner), with specifications by OEMs for design, validation, and future homologation processes.

Since 2023, ADScene initiative has been supported by the French Automotive Platform (PFA), and Government (DGITM – French Mobility, Transport, and Infrastructure General Directorate). It is a tool for scenarios-based approaches.

A key message at DSC 2023 was that scenario-based design, testing and safety analyses are mandatory not only for ADS, but also for ADAS systems. These analyses are rated as enablers to federate actors around a common understanding of regulatory scenarios.

The other critical item that will be addressed thanks to scenario-based approach is capitalization of unknown-unsafe SOTIF scenarios, i.e., **Safety Of The Intended**

Functionality processes, and also accident scenarios in order to design ADAS/ADS using scenarios extracted from real life data and described in a harmonized language.



Figure 1. - VI-grade's compact FSS and Ansible's driving simulators

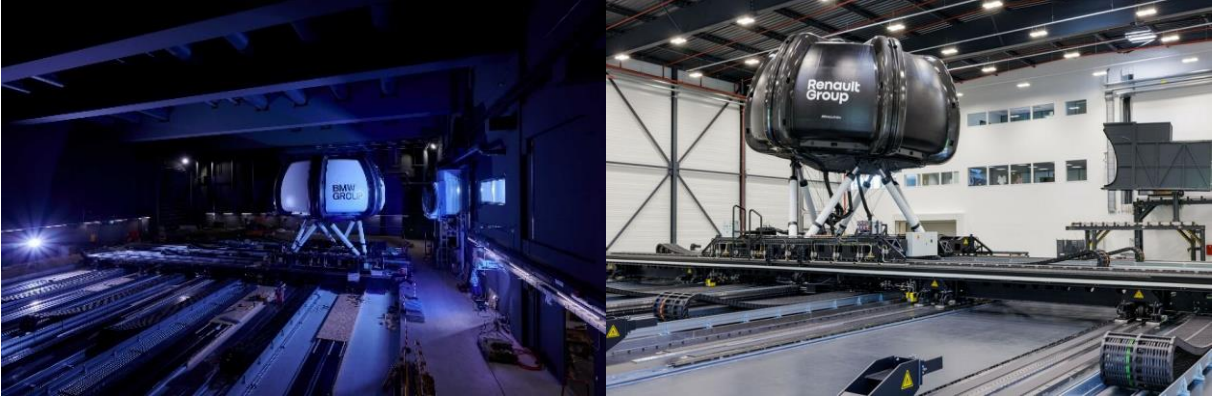


Figure 2. BMW's and Renault high-performance driving simulators

Wide-ranging Simulation is mandatory

Added to which the introduction of autonomous vehicles with their new self-driving technologies needs to be harmonized with and accepted by their human vehicle occupants. Tomorrow's drivers need to be made familiar with a new way of driving and learn how to handle a wide range of new technologies. Driver in the Loop (DIL) simulation makes that possible.

One of the DIL simulation providers, VI-grade has launched the compact Full Spectrum Simulator. This simulator combines large motion, high frequency vibration and sound in a small footprint simulator and was showcased at the conference exhibition.

The ability to evaluate and optimize Ride and Handling, NVH (Noise, Vibration and Harshness) and accurate sound in one simulator will dramatically reduce vehicle development time. This directly translates into a significant reduction of costs, which again is paramount for OEMs in their fierce battle for margins. Many other Driving Simulator providers, including Ansible, AV Simulation or Dynisma, provide a full scale of fixed based configurations for HMI validation (Human Machine Interface) to full-scale multi-million high performance driving simulators, used by BMW and Renault.

A whole new world of simulation was first designed and built by BMW, under the auspices of Martin Peller responsible for New Technologies, User Interaction, Driving

Simulator in the new BMW Driving Simulation Park. The BMW Simulation Park with its 14 different versions and sizes of driving simulators is unrivalled for its expansiveness. Only a year later, Renault completed their own Driving Simulation Center in Guyancourt, France, including an XR Innovation Lab and several driving simulators, among them ROADS (Renault Operational Advanced Driving Simulator) itself, the latest state of the art and multimillion high-performance DIL testing and validation system. The French car manufacturer and BMW appreciate very much the exchanges at DSC helping them to keep at the highest technical level their huge simulators and deploy them efficiently for the best car design and user experience.

With a little Help from Friends in Competition

Martin Peller and his team from BMW are just one good example of how a cooperative spirit helps the overall good of increasing safe mobility even further – despite Renault and BMW being competing OEMs. It is in this spirit that DSC has been invented and every year is conducted highly successfully.

In conclusion, let us therefore emphasize how much we are looking forward to seeing you again next year. So, here’s to lots of inspiring papers and demonstrations, and stimulating talks and debates during and after the sessions. In other words: Au revoir à Strasbourg for our 23rd assembly of dedicated and enthusiastic participants from all over the globe!



Figure 3. DSC Europe 2023 VR exhibitors