

ADAS

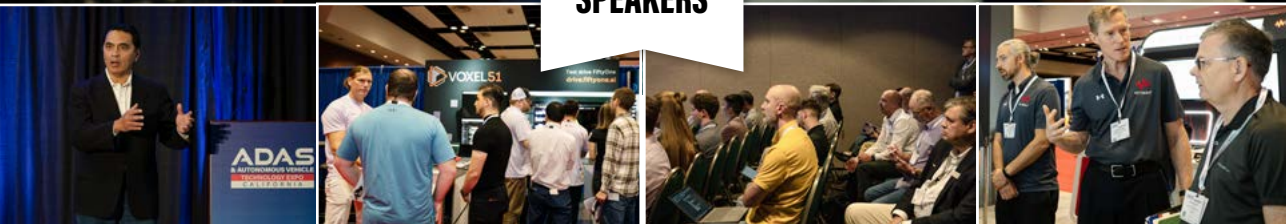
& AUTONOMOUS VEHICLE
TECHNOLOGY CONFERENCE

AUGUST 28 & 29,
SAN JOSE MCENERY CONVENTION CENTER, USA

CONFERENCE AGENDA



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On August 28 and 29, the San Jose McEnery Convention Center in Silicon Valley will play host to the third ADAS & Autonomous Vehicle Technology Expo California, gathering a community of global industry experts, regulatory leaders, engineers/scientists/researchers and technicians from OEMs and tech startups working on future mobility, robotaxis, last-mile delivery, autonomous trucking, buses, and more to exchange ideas and delve into the latest trends and technologies that are shaping the future of automated driving and autonomous vehicles.

Comprising a free exhibition with specialist suppliers displaying the end-to-end ADAS/AV ecosystem and an industry-leading conference (rates apply), everything you need to develop a software-defined vehicle will be held under one roof.

Join your peers and 50+ industry-leading speakers for high-level insight and the latest case studies on innovations in developing software AI, big data and architecture, regulations and standards, safety considerations and much more.

What to expect

- 20+ hours of content.
- Gain inspiration, find fresh perspectives, see new projects and technologies.
- Share knowledge in person with global industry experts, policy makers, regulatory leaders, engineers, scientists, academics, researchers and technicians.
- 50+ speakers from OEMs, Tech Startups and Tier 1 suppliers will share best practices, the latest case studies and innovative strategies for the latest ADAS/AV testing protocols, procedures and solutions and help accelerate the development of next-gen vehicles, future mobility, robotaxis, last-mile delivery, autonomous trucking, buses, and more.
- Plan your ideal itinerary around 6 sessions, each with technical presentations or panel discussions, including:
- Developing software AI, big data and architecture - challenges and innovations
- Regulations, standards, metrics and collaboration - building blocks for safe ADAS and AD technologies
- Safety considerations and best practices for advancing ADAS & AV technologies
- Hear from: Wayve, Waymo, HASS COE, General Motors, IBM, Dell Technologies, Microsoft, Plus, Pony.AI, SAE-ITC, The Goodyear Tire & Rubber Company, Volvo and Torc Robotics, among others.
- Each presentation finishes with a Q&A so come prepared with questions!
- Complimentary lunch and refreshments.
- Access to the presentation slides after the event.

Who should attend:

- OEMs (Car Manufacturers)
- Tier 1 & Tier 2 component suppliers (Automotive)
- Autonomous Vehicle Tech StartUp companies
- Local Highway depts/ department of transportation/ traffic engineering
- Local Offices of the Attorney General

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PLEASE NOTE: Conference passes are valid for FREE ENTRY into the exhibition on BOTH DAYS



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DAY 1 WEDNESDAY, AUGUST 28**9am - 12.30pm Key issues, strategies and innovations and their implications for safe AD/ADAS development and deployment****Room 1****Continuously delivering safety cases for an ADAS/AD product – easy?****Hakan Sivencrona**, senior technical leader, Volvo Cars, Sweden

For traditional E/E systems for automotive, if that is an allowed expression, functions were developed to be sufficiently good, such as ABS. ISO 26262 was then applied to enable the definition of additional means and measures so that implementation would be reasonably safe for use, or fulfilling the ISO 26262 safety norm. For ADAS and AD we have a more complex situation. We are more or less forced to release functional growth along with the advances of functional development and the verification and validation of the same. This puts very stringent requirements on the components that constitute the ADAS or AD. All safety-relevant components need to have their contribution to the safety case known and deviations of the same taken care of by the system. What does that imply? A lot. The presentation will elaborate on some of the areas of concern such as the Seooc concept and ODD expansion in the light of ISO 26262, as well as verification in the light of ISO 21448.

Transitioning from research to production-level autonomous vehicle testing**Evan Smith**, engineering manager for vehicle testing, Torc Robotics Inc., USA

Torc has a rich, diverse history in the autonomous vehicle space dating back to 2005. Since becoming an independent subsidiary of Daimler in 2019, Torc has become laser-focused on delivering an autonomous long-haul trucking solution. Torc's team of highly trained test crew (in-vehicle fallback test drivers and safety conductor) are an important part of its research and development testing to help ensure safety. The research testing has evolved into a rigorous development lifecycle process. As we progress toward driverless operations, a cohesive cross-platform SIL/HIL/VIL testing strategy which includes best practices and standards will need to be employed. Attend the session to learn about Torc's testing journey including specific testing examples its our plans for continuing to work toward delivering a safe and reliable autonomous solution.

Autonomous vehicle safety readiness for ridesharing service**Wei Lu**, senior manager, Didi Research America, USA**Applying modern AI to advanced autonomous driving****Dr Anurag Ganguli**, VP of R&D, Plus, USA

Join Anurag's presentation and dive into the application of latest AI models in developing autonomous driving technology, discuss the transformative impacts of modern AI in building more robust and adaptive AD systems and share Plus's real-world commercialization experience across the U.S., Europe and Australia.

The role of inertial sensors for automated driving**Curtis Hay**, technical fellow, General Motors, USA

In addition to perception sensors such as cameras, lidar and radar, accurate vehicle localization requires intelligent use of 'absolute' sensors such as GNSS, inertial measurements and a high-definition map. This presentation describes some of the key requirements and design trade-offs for inertial sensors, and how these sensors contribute to automation in challenging environments.

Understanding the safety challenges of automated driving systems-equipped (ADS) vehicles – analysis of ADS disengagements**Dr Mubassira Khan**, senior scientist, HASS COE, USA

This study developed an initial typology of causal factors that led to automated driving system (ADS) disengagements based on 2022-2023 CA DMV's Autonomous Vehicle Tester (AVT) program data. The goal of this study is to eventually understand the crash problem of automated vehicles (AVs) by creating typologies for their causal crash factors and common pre-crash scenarios, similar to prior research on human-driven vehicle (HDV) crashes for effective ADS development.

Tire intelligence for ADAS and AV applications**Kanwar Bharat Singh**, program manager, algorithms and software engineering, The Goodyear Tire & Rubber Company, USA**TORC****DiDi****Plus****HASS**
Highly Automated Systems Safety
Center of Excellence

2pm - 5pm Regulations, standards, metrics and collaboration – building blocks for safe ADAS and AD technologies

Room 1

TBC

Dr Bernard Soriano, deputy director, California Department of Motor Vehicles, USA

Automated driving system behavior evaluation

Azadeh Dinparastdjadid, senior research scientist, Waymo, USA

The behavioral capability of the automated driving system (ADS) is an important attribute of ADS safety. Behavioral capabilities can be categorized into three broad categories: regulatory compliance, conflict avoidance and collision avoidance. In particular, the annexes in ISO 2022 highlighted the need for more detailed scenario-dependent behavioral evaluation around conflict avoidance. Assuming the identification of a set of scenarios a-priori, this points to the need for objective metrics that can evaluate whether the behavior of the ADS meets the scenario-specific behavioral targets. This presentation aims to discuss computational metrics that can be used as behavioral benchmarks for flagging when ADS behavior does not meet expectations. Such metrics can also be applied to discovering novel scenarios and events with behavioral issues from existing data sets.

Building trust in AVs via safety metrics

Quresh Sutarwala, lead systems engineer, Kodiak Robotics, USA

A safety case is a topic that has been much discussed when it comes to safe deployment for AVs. Within the framework, it becomes critical to talk about what metrics are identified, generated and reported upon. Even more critical is their relevance and impact on building trust and confidence, internal and external. This topic dives into metrics within a safety case and their value and impact in building trust.

Updates from ASAM OpenODD specifications: taxonomy, modular conditions and operational domains

Dr Edward Schwalb, consultant, Schwalb Consulting llc, USA

What is the AVSC and how is it influencing standards?

Edward Straub, executive director, SAE-ITC, USA

The presentation will include an overview of the AVSC (Automated Vehicle Safety Consortium) and its mission regarding the development of best practices and how they lead into other standards organizations, along with the impact and influence AVSC has had since its inception in 2019.

Open Source SDV Development: Autoware Open AD Kit 3.0

Christian John, president, Tier IV, USA

This presentation will introduce the Autoware Open AD Kit 3.0, a collaborative effort from key software-defined vehicle stakeholders such as Arm, AWS, eSync Alliance, Leo Drive, Excelfore, RedHat, PIX Moving, SOAFEE and TIER IV. The Open AD Kit framework is a testament to Autoware Foundation's vision of developing SDV solutions based on open standards and collaboration. On the technical side, the presentation will go through the company's elaborate CES demo to explain the essential components (cloud-native, DevOps, OTA, containerization, etc) that enable the big loop, a concept that is frequently used to describe how modern software development methodologies are translating into automotive.

9am - 12.30pm Developing software, AI, big data and architecture – challenges and innovations

Room 2

Accelerating software-defined vehicles through open source

Dan Cauchy, executive director, Automotive Grade Linux, USA

The concept of a software-defined vehicle (SDV) has become a hot topic across the industry as auto makers look for ways to address the dramatically growing complexity of developing and deploying software while simultaneously building the foundation for self-driving vehicles. Automotive Grade Linux (AGL), an open source software platform for connected car technology, has been working on software-defined vehicles for

the past eight years. Dan Cauchy, executive director of AGL, will discuss the current state of SDVs and the work being done by auto makers and Tier 1s as part of the AGL SDV Expert Group. He will also provide insight into the driving trends behind SDVs and enabling technologies including virtualization, containers and the cloud.

Exploring generative AI in AD/ADAS: applications and limitations

Esti Mor Yosef, senior program manager, Microsoft, USA



Developing and deploying self-driving technology safely

Sean Harris, director of embodied AI , Wayve, USA

After two decades and billions of dollars being poured into self-driving, access to this technology is limited to a few locations. Before we can realize the tremendous personal and societal value that driving assistance and automation promise to deliver, we must design a system that can safely and verifiably handle the persistent long-tail of real-world driving scenarios. Traditional systems have failed to tackle the long-tail of driving scenarios using brittle and time-consuming rules-based programming. Wayve is pioneering a new approach using end-to-end embodied AI. Wayve will present its end-to-end embodied AI as a solution to effectively handle complex, real-world driving situations.

Accelerate AV development with data-driven automotive AI

Chris Maestas, chief executive architect, IBM storage for data and AI solutions, IBM, USA

Developing AVs is a time-intensive and complex process that requires best-in-class data and AI training infrastructure. Companies developing software-defined vehicles need to accelerate time-to-market and minimize costs without sacrificing safety, combining vehicle sensors, map data, telematics and navigation guidance using machine learning and data fusion techniques. Data-driven development is not without its challenges. One of the biggest challenges is data collection and integrity, as data needs to be collected accurately and consistently to drive accurate decisions. Additionally, data-driven development requires data analysis capabilities, as information needs to be analyzed and interpreted to make meaningful decisions. Finally, data-driven development requires collaboration between stakeholders and technical teams to ensure that data is being used appropriately. In close collaboration with Red Hat and Nvidia, IBM will deliver fully integrated systems that bring AI-powered computing to everywhere data is created, from the edge to the cloud, helping businesses easily deploy tailored AI applications to drive innovation. This presentation examines how to best leverage AI-powered data infrastructures and software to accelerate AV development and achieve maximum efficiency.

Accelerating ADAS and autonomous vehicle development with cloud-native solutions

Vineeth Venkiteswaran, WW solutions and GTM strategy lead, autonomous driving, Amazon, USA

Stefano Marzani, WW tech leader, SDV, Amazon Web Services, USA

Girish Shirasat, senior director of product management, Qualcomm, USA

Autonomous vehicles collect petabyte-scale sensor data. The IoT FleetWise Rich Sensor data solution allows auto makers to scale the collection and transfer of meaningful data by defining driving campaigns, enabling them to extract more value and context, reducing the time and cost of autonomous driving feature development. Simultaneously, software is playing a pivotal role in vehicle design and evolution, driving the transition toward software-defined vehicles (SDVs). This session will showcase the latest breakthroughs in cloud-native development, demonstrating how auto makers can leverage AWS and Qualcomm technologies, such as the Snapdragon Digital Chassis, to scale and accelerate vehicle software development, including leveraging virtualized digital twins and cloud-native tools to test and validate code. This session aims to equip attendees with the knowledge and strategies to embrace the 'Big Loop' of data-driven and software-defined development, accelerating the path to safer and more capable ADAS and autonomous vehicle technologies.

Integrating FPGA and AI technology

Gordan Galic, technical marketing director, Xylon, Croatia

Rehan Tahir, senior manager, automotive product management and marketing, AMD, USA

2pm - 5pm Key components in the ADAS/AD test and development toolchain

Room 2

ADAS performance variability in unique and challenging scenarios

Sean Scally, senior associate, Exponent Inc., USA

The presentation will explore ways of visualizing the performance of certain ADAS features in scenarios currently tested in NHTSA's NCAP and provide insight into some unique and challenging scenarios where performance is degraded or becomes more variable.

ODD modeling, scenarios and ODD coverage – safety-driven validation

Gil Amid, chief regulatory affairs officer, Foretellix, Israel

The presentation introduces modeling of ODD (operational design domain) in ASAM OpenSCENARIO DSL 2.1, and incorporating it into safety-driven validation of ADS. It presents virtual testing, interaction of scenarios and ODD. Specific attention will be given to the challenges of modeling ODDs and validating correct behavior of the ADS within an ODD.



Simple on-production target verification of ADAS software

Tim Foster, senior solution consultant, ETAS, USA

In order to validate that your autonomous software is capable of behaving correctly in all driving scenarios, including those one in 10 million driving events, it is necessary to employ a comprehensive simulation and testing methodology that supports the replay of real-world vehicle data. The cornerstones of a comprehensive testing strategy most likely include a pure virtual software open loop (SoL) solution as well as a hardware open loop (HoL) testing solution. Together with our OEM customers, we have identified an additional market need for a simpler and less expensive (compared with HoL) production target replay and simulation solution.

Development of ADAS systems: from critical scenarios to virtual hardware

Akshay Sheorey, Siemens Simcenter automotive industry ADAS/AD lead, Siemens Industry Software Inc., USA

The rapid advancement of software-defined vehicle and related advanced driver assistance systems (ADAS) necessitates a progressive approach not just to software development but also the electronics hardware and physical systems development for delivering the features. By leveraging holistic digital twins, auto makers can significantly enhance the robustness and thorough testing of ADAS functionalities. This shift left approach integrates scenario-based testing, virtual validation and compliance with Safety Of The Intended Functionality leveraging virtual hardware for digital validation before the hardware is finalized.

Transforming autonomous transit: lessons learned from real-world ART operations

Dr Jia-Ru Li, CEO, Lilee Systems, USA

Explore the future of autonomous transit with our autonomous rapid transit (ART) system, as we explore its real-world applications in enhancing transportation services for airports and public transit. We will share several ART operations utilizing full-size buses and ADA-compliant vehicles, alongside an innovative ART airport people mover project that integrates electric buses and a vehicle management platform. We will discuss the implementation process and lessons learned in adopting these solutions. Join us and uncover how ART offers faster deployment and reduced total costs while meeting safety requirements, making it a game-changer for the autonomous transit market.

Reduction of parameter space scenario testing via safety model

Dr Sean Hubbard, research scientist, GCAPS, USA

Reduction of the parameter space for synthetic scenario creation is conducted with a novel approach using the GCAPS safety model. Using real-world data from perception systems, CISS, or naturalistic driving data, the decomposition process of GCAPS creates a concrete scenario. The concrete scenario is parameterized, and ranges of the parameters are identified. The safety model uses the object trajectories, road path and informed statistics to determine several metrics such as conflict probability. Applying the safety model to the concrete scenario and parameter ranges segregates the parameter space by the safety model metrics, enabling a focused evaluation of the ADAS.

DAY 2 THURSDAY, AUGUST 29

9am - 3.40pm Safety considerations and best practices for advancing ADAS and AV technologies

Room 1

Using model-based system engineering in ISO 26262 processes with independence

Alexander Lim, lead field application engineer, LDRA, USA

This study investigates the integration of model-based system engineering (MBSE) into ISO 26262 processes, focusing on the idea of independence in safety-critical automotive systems. This idea is borrowed from other domains, like DO-178C for aviation, and extended with back-to-back testing. Practices and tools commonly used in MSBE will be examined, and their place in the verification and validation process will be shown. The role of independence at various safety integrity levels will be examined. Finally, a case study will be presented to show how this can be achieved with existing tools and processes.

Enhance and enable Level 4 autonomous parking with Real-time HD Semantic Map solutions

Dr Andy Xiao, product technical manager, Valeo, USA

The automotive industry is undergoing rapid transformation with the introduction of new vehicle architectures and software-defined vehicles, alongside advanced processing platforms. This shift creates a wealth of innovative data-driven opportunities. In this presentation, Dr Xiao will explore real-time HD semantic map solutions designed to enhance parking experiences and enable Level 4 autonomous parking systems. The solutions use low-cost sensors – surround-view cameras – to create sharable parking lot maps. These maps, stored in the cloud, provide real-time updates on parking spot availability and type (EV, handicapped, etc). Dr Xiao will explain how these advancements lead to smarter, more efficient parking solutions.



Developing sustainable eco-driving strategies for connected and autonomous electric vehicles

Fengxiang Qiao, professor and co-director, Texas Southern University, USA

Connected and autonomous electric vehicles (CAEVs) allow the deployment of more advanced driving strategies, such as ecological driving (or eco-driving) strategies, toward even lower energy consumption when driving on streets and passing intersections. Deep Learning-based algorithms can be used to optimize the eco-driving strategies for CAEVs on transportation networks (isolated intersections, arterial streets and road networks.) Computer simulation and driving simulators can be used to evaluate the effectiveness of the proposed optimization models and eco-driving strategies. Such a study helps car manufacturers and transportation and environmental agencies at all levels understand the design, operation and impacts of optimal eco-driving strategies.

An analysis of AV and ADAS shortcomings and potential solutions

Cameron Gieda, director of business development, Pony.AI, USA

It seems that on a weekly basis we see another accident or incident involving the apparent failure of an AV or ADAS. Regardless of the frequency of these incidents, they are used as fodder by the media to frighten the public, earning more clicks and add revenue. We've seen AVs jamming up streets, hitting cyclists, dragging pedestrians and a recent tragedy where a Ford MachE (supposedly with Blue Cruise engaged) struck a stopped vehicle on a highway, resulting in a fatality. I will discuss my opinions as to why such incidents happen and propose technical solutions to reduce or eliminate these issues in the future. Solutions can take the form of better or increased sensors on vehicles or more robust localization and communication

systems. There are also many investments that can be made around infrastructure, which could greatly improve the safety and efficiency of ADAS and AV systems. I will discuss a few of these technical approaches (including V2V and V2X) as well as who should be paying for them.

Effects of aftermarket modifications on a vehicle's ADAS functionality

Luis Morales, director of vehicle technology and product development, Specialty Equipment Market Association (SEMA), USA

As ADAS technology proliferates in passenger vehicles, there is a pressing need to understand how aftermarket modifications may affect the functionality of these systems. To address these challenges, SEMA stays at the forefront of research and testing, particularly with rapidly evolving vehicle technologies such as ADAS and autonomous features. In this presentation, SEMA will share the results of its groundbreaking research projects that tested the effects of various aftermarket modifications (suspension lifts) on the ADAS functionalities in a Chevrolet Silverado and Ford F150, including lane departure warnings/lane-keeping assist, forward collision warnings/automatic emergency braking, blind-spot detection and rear cross-traffic alerts.

Preventing unexpected behaviors in autonomous vehicles

Bodo Seifert, senior automotive functional safety engineer and practice lead, TÜV Rheinland of North America, USA

Four lines of defense to a safer vehicle: process – build what you specify (automotive SPICE); functional safety – ISO 26262:2018; safety of the intended function – ISO 21448; cybersecurity ISO 21434.

Panel discussion: Where standards and regulations meet - how can they best interact?



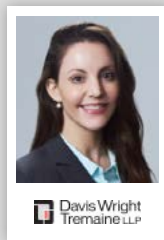
Gil Amid



Dr Sven Beiker



Benjamin Engel



Katherine Sheriff

Gil Amid, chief regulatory affairs officer, Foretellix, Israel

Dr Sven Beiker, external advisor, SAE International, USA

Benjamin Engel, chief technology officer, ASAM eV, Germany

Katherine Sheriff, lead, mobility and transportation industry group, Davis Wright Tremaine, USA

Join a lively discussion of the current landscape for regulations and standards, as well as what developments might be on the horizon. Our expert panel will also discuss possible interactions between the two, what barriers there might be to interaction and how they might be negotiated.



ISO 26262 for cloud-based precise positioning

James Tidd, automotive chief engineer, Swift Navigation, Sweden

Simon Reichert, senior ADAS expert, Amazon Web Services, Germany

As the automotive industry advances toward higher levels of vehicle autonomy and vehicle-to-everything (V2X) communication, cloud-based services will play a larger role. While the ISO 26262 standard sets functional safety requirements for software running inside the vehicle, cloud-based applications must adhere to the same requirements. Swift Navigation's Skylark Precise Positioning Service is a cloud-based GNSS corrections service running on AWS that provides vehicles with high-accuracy location data for precise navigation, ADAS and autonomy and V2X communication. Skylark recently achieved ISO 26262 certification, elevating the role of GNSS in the automotive sensor suite and setting a design pattern for the development of cloud-based applications used for safety-critical use cases. Learn more about the service architecture and cloud infrastructure used to ensure compliance with safety standards while leveraging the unique benefits of the cloud.

The 5GAA roadmap for advanced driving: connectivity as a linchpin

Jim Misener, global V2X ecosystem lead / board member, Qualcomm/5GAA, USA

This session will present a vision for how connectivity technologies can meaningfully support advanced driver assistance systems (ADAS) worldwide. The 5GAA roadmap for advanced driving includes both wide area and local broadcast communications and shares a vision for how they can augment ADAS solutions. Attendees will learn the immediate and near-term benefits of vehicles equipped with 5G modems and gain insight into the regulatory and standards headwinds to overcome.

Innovative techniques and methods for a changeable roadway testing environment

Param Sankar, head of transportation & smart infrastructure division, Battelle Memorial Institute, USA

Battelle is assisting the Federal Highway Administration (FHWA) with research to develop realistic and easily changeable mock roadway features (e.g. curbs, pavement markings, barriers, vegetation) to rapidly create and take down diverse scenarios for testing automated driving systems (ADS). These realistic, lightweight, portable (mock) roadway features will enable proving grounds and other facilities to increase their testing adaptability and agility without having to invest in expensive infrastructure upgrades. We will present several concepts under development – including foam curbs, removable pavement marking and lightweight concrete barriers – and the methods used to develop and test them (e.g. sensor signatures, likeness and durability testing).

Formal methods: game-changer in ensuring automotive software safety and security

Jason Landers, director of systems engineering, TrustInSoft, USA

The presentation will show how, through automating the use of formal methods via abstract interpretation among other techniques, enterprises can alleviate the tester burden, reduce iterations generated by penetration, fuzzing and unit testing, and allow developers to focus on high-value tasks. This unique approach, which combines static and dynamic analysis, was recommended by NIST (NIST.IT.8151) and the White House's ONCD, and has the additional powerful advantage that it yields no false negatives. This means a guaranteed absence of undefined behaviors like buffer overflows. We will further demonstrate how developers can comprehensively verify software properties and produce critical-bug-free code, ensuring memory safety.

9am - 3.40pm State of the art hardware and software test & development

Room 2

Next-generation ADAS test for V2X and vehicle-level radar test

Ram Mirwani, senior group manager, business development, automotive, Rohde & Schwarz, USA

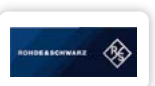
As Level 3 ADAS functions continue to dominate vehicle roadmaps in the short term, testing these ADAS functions adequately is a continuing challenge for the automotive ecosystem. In this session, Rohde & Schwarz will introduce two new test methods for ADAS testing: the optimized, cost-effective on-vehicle radar test and combining V2X with the sensor HIL test for pre-road test reliability tests. The session will share initial project/demo descriptions, key learnings and potential application areas for these new test methods.

Meeting SOTIF for ADAS/AD through efficient software and scenario validation

Felix Mueller, general manager, TraceTronic, Inc, USA

Florian Rohde, Managing Partner, iProcess LLC, USA

Validation of automated driving functions, especially for SAE L3, has become a challenging aspect of new vehicle development. Large quantities of tests have to be performed in different environments. Complex SIL and HIL setups and highly scalable cloud simulations are necessary to cover the required testing. In ISO 21448 (SOTIF), sampling is a central component and focuses on targeted parameterization and variation of scenarios. In this presentation, the audience will learn about the SOTIF standard and its effect on vehicle development. We will also present a scalable, virtual toolchain solution for automation, parameterization and efficient, targeted analysis of the test.



Enhancing autonomous vehicle development through simulation**Daniel Tosoki**, product director, aiMotive, Hungary

Explore the critical role of perception simulation in developing safe and reliable autonomous vehicles. This keynote offers an in-depth look at aiMotive's aiSim and its capabilities in simulating real-world sensor data to train and validate perception systems. Learn how aiSim empowers engineers to create highly realistic and challenging scenarios for perception algorithms, ensuring they are prepared for complex road environments. Discover the impact of perception simulation on accelerating the development of AI-driven perception in self-driving technology.

Argonne's anything-in-the-loop workflow: assessing the energy impact of CAVs**Miriam Di Russo**, connected and automated vehicle research engineer, Argonne National Laboratory, USA**Jongryeol Jeong**, principal research engineer, Argonne National Laboratory, USA

Estimating connected and automated vehicles' (CAVs) energy impacts is challenging due to the non-linear dependence between CAVs' interactions with the environment and the scarcity of real-world data. To overcome these limitations, an 'anything-in-the-loop' (XIL) workflow has been developed. The XIL workflow integrates various CAV controllers into real powertrain components or vehicles in a safe, controlled and highly repeatable experimental environment, enabling a thorough validation and analysis of functionalities, dynamic performance and energy impacts. The presentation provides an overview of the workflow tasks and highlights achievements in energy conservation and insights into validating a multivehicle simulation leveraging experimental results.

A server-based HIL rig proposal**James Singer**, CTO technologist, Dell Technologies, USA**Lazaar Louis**, product management and marketing director, Ambarella Automotive, USA

An essential methodology that every ADAS/AD project must leverage is hardware-in-the-loop testing (HIL). While traditional HIL testing is more accurate than SIL, it runs orders of magnitude more slowly than cycle-for-cycle software-in-the-loop testing. Complexity, cost and deployment challenges limit scalability. In this session, Ambarella, in cooperation with Dell, will introduce a new methodology that delivers a low-cost, scalable server-based HIL rig simulation architecture that matches or exceeds the speed and accuracy of traditional HIL rigs for AI model verification with the flexibility of on-premises and/or remote deployment.

Precipitation characterization for ADAS development of sensor performance at ACE**John Komar**, executive director, Automotive Centre of Excellence (ACE), Ontario Tech University, Canada

Ontario Tech University/Automotive Centre of Excellence's core research facility will share the journey of the precipitation characterization and testing functionality of ADAS for soiling due to weather impacting the vehicle sensors and detecting targets. Ontario Tech and ACE are leading the way in developing new, advanced development routines and testing methodologies for real-world weather conditions. The world-class Climatic Aerodynamic Wind Tunnel and other environmental chambers provide testing in rain/snow/ice/fog in varying temperatures and humidity. ACE provides calibrated rain/snow/ice/fog precipitation characterization that accurately and repeatably reproduces real-world performance of lidar, radar, cameras and other optical sensors in full vehicle operation.

Radar ADAS: virtual modeling of targets**Vanessa Palmier**, research engineer, IRT SystemX, France

The safety of autonomous systems is one of the challenges addressed by the CVH project at IRT SystemX through simulation. One of its aims concerns perception, considering physically realistic simulation of sensors, from a hardware point of view on one hand, and modeling of the environment on the other hand. In the case of radars, the applied methodology comprises four main topics: building the virtual sensor, modeling virtual targets, describing simulation scenarios and characterizing the phenomenological model of perturbations. This paper discusses modeling virtual targets, in order to demonstrate the relevance of our methodology through quantified results.

Is ADAS a bridge to full autonomous driving?**Dr Ilan Shaviv**, CTO, Imagry, USA

Both these AD approaches utilize sensors, hardware, processors, cameras, etc, but their integration and computing power requirements are different. The presentation will examine where the concepts diverge and determine if there is a direct path from one to the other. Another essential factor to consider is how the vehicle perceives the immediate environment. Different mapping options – HD Maps versus mapless – will be presented and compared.



Novel trends of 3Dlidar visualization systems for automotive technologies

Prof Valeriy Savelyev, chief scientific officer, IQP – Integrated Quantum Photonics, Houston, TX, USA

Analysis of the current state of development of autonomous vehicle technologies requires a critical analysis of the requirements and key elements of autonomous driving systems, in particular visualization systems. The report focuses on emerging trends in lidar sensor technologies to improve the performance of autonomous vehicles. New trends include new optical sensors with improved performance, fast response principles of lidar sensors, optical laser beam distribution systems – particularly diffractive optics, and a new method of obtaining information in a visual camera format with distance information (possibly in color), which allows users to analyze information based on artificial intelligence on a chip and others.

Targetless lidar calibration – unleashing new dimensions in autonomous tech

Mohammad Musa, founder and CEO, Deepen AI, USA

The presentation will cover challenges with traditional lidar calibration, advantages of targetless calibration, use cases and applications and Deepen AI's targetless calibration.

Generative AI for requirements management and continuous homologation in autonomous engineering

Stephen Lernout, co-founder and CEO, Deontic, Belgium

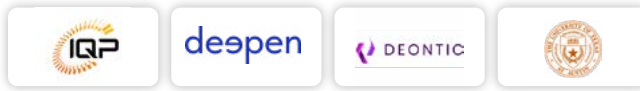
Expand your operational design domain (ODD) and cover new geographical regions by fine-tuning large language models (LLM) and augmenting autonomous driving scenarios with abstract knowledge of standards, regulations and laws.

Efficient driver behavior computation for ADAS

Rohan Chandra, postdoctoral research fellow, University of Virginia, USA

Existing ADAS only automate basic vehicle control like cruise and lane management. No ADAS currently assists by observing other drivers' behaviors and styles. The University of Texas, Austin presents algorithms that identify nearby drivers' behaviors and actions using readily available sensors directly on vehicles in real time with minimal computational demands. These algorithms use unprocessed sensor data, avoiding any data processing and allowing seamless integration into existing ADAS. Behavior prediction ADAS fit between the perception and the planning layers of the autonomous vehicle infrastructure. The algorithms have been applied to diverse traffic data from India, China, Singapore and the USA, demonstrating their global applicability.

**This program may be subject to change*



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